(a) Diagram10 shows a point M on a Cartesian plane.

Rajah 10 menunjukkan titik M pada suatu satah Cartes.

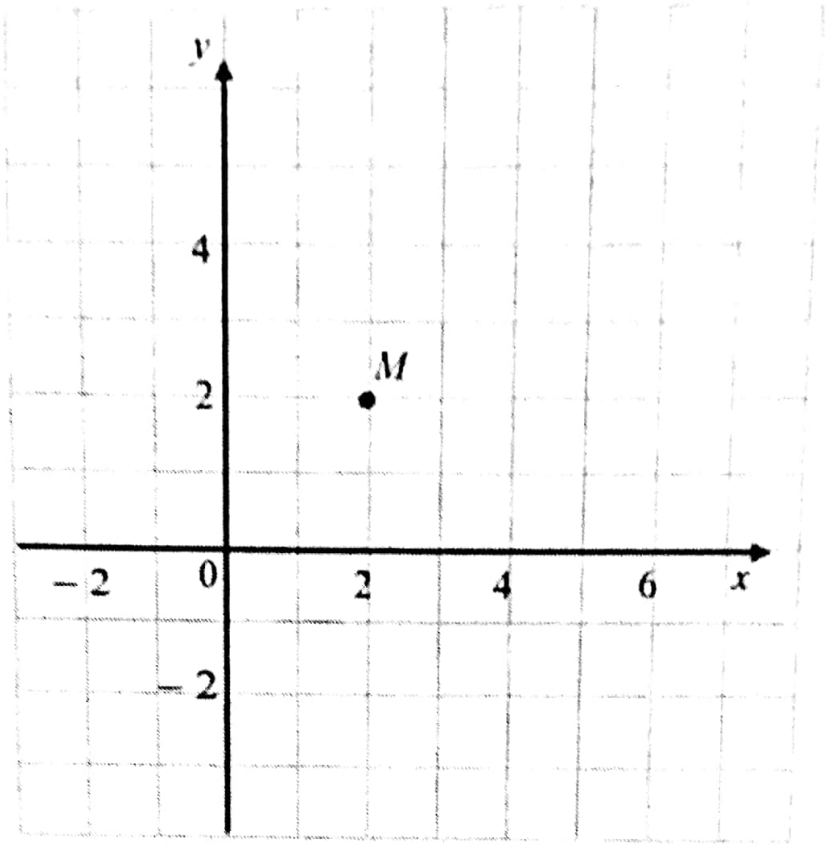

Diagram10

Rajah 10

Transformation **T** is a translation $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

PERLIS

Transformation **P** is a reflection on the x-axis.

Transformation **R** is a rotation of 90° clockwise about the centre $(4, 0)$

State the coordinate of the image of point M under the following transformations:

Penjelmaan **T** *ialah translasi* $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

Penjelmaan **P** *ialah pantulan pada paksi-x*

Penjelmaan **R** *ialah putaran* 90° *ikut arah jam pada pusat* $(4, 0)$

Nyatakan koordinat imej bagi titik M di bawah penjelmaan berikut.

(i) **T**

(ii) **PR**

[3 marks]

[3 *markah*]

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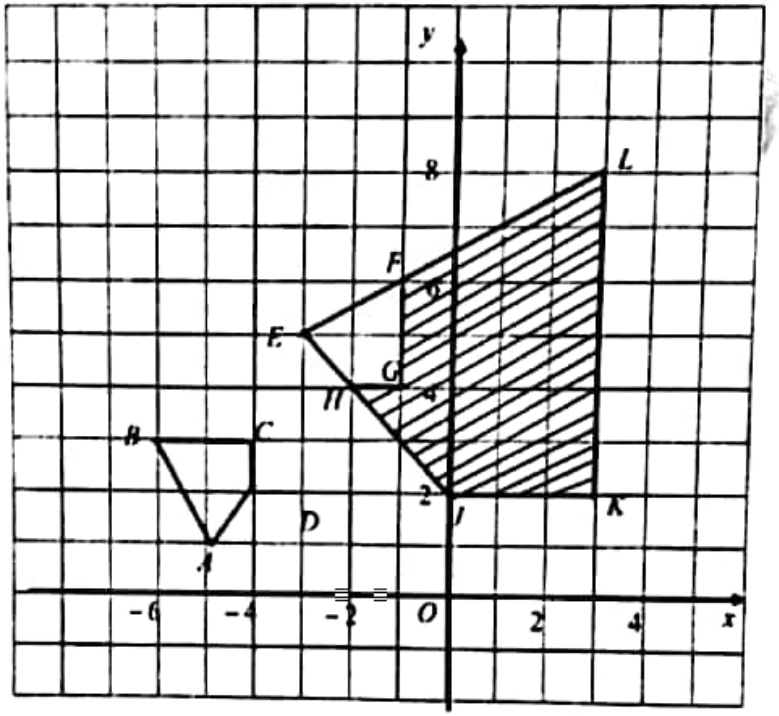
(i) Diagram 11 shows three quadrilaterals *ABCD*, *EFGH* and *EJKL*, drawn on a Cartesian plane.

Rajah 11 menunjukkan tiga sisi empat ABCD, EFGH dan EJKL, dilukis pada suatu satah Cartes



PERLIS

Diagram 11
Rajah 11

Quadrilateral *ELKJ* is the image of quadrilateral *ABCD* under the combined transformation **WV**.

Describe in full, the transformations :

Sisi empat ELKJ ialah imej bagi sisi empat ABCD di bawah gabungan penjelmaan **WV**.

Huraikan selengkapnya penjelmaan :

(a) **V**,

(b) **W**.

(ii) It is given that the shaded region *HGFLKJ* represents the area of 248 m^2.
Calculate the area, in m^2, of the region represented by *EFGH*.

Diberi bahawa kawasan berlorek HGFLKJ mewakili suatu kawasan yang mempunyai luas 248 m^2.
Hitung luas dalam m^2, *kawasan yang diwakili oleh EFGH*

[9 marks]
[9 *markah*]

Scanned with CamScanner

13	(*a*)	(i) (0, 5) (ii) $(6, -2)$ Note: (6, - 2) marked on the diagram or $(6, 2)$ seen or (6, 2) marked on the diagram, award P1.
	(*b*)(i)	(*a*) **V** = Rotation 90° clockwise centre $(-2, 2)$ *//Putaran 90° ikut arah jam pusat* $(-2, 2)$ Note: 1. Rotation 90° clockwise *or* Rotation centre (-2,2)// Putaran 90° ikut arah jam *or* Putaran pusat (-2,2), award P2 2. Rotation // *Putaran* award P1 (*b*) **W** = Enlargement of scale factor 3 with centre $E(-3, 5)$ or equivalent *Pembesaran dengan faktor skala* 3 *pada pusat* E $(-3, 5)$ Note : 1. Enlargement of scale factor 3// Enlargement with centre E (-3, 5) award P2 *Pembesaran dengan faktor skala* 3 // *Pembesaran pada pusat* F (-3, 5) 2. Enlargement // *Pembesaran* award P1 **OR** equivalent.
	(*b*)(ii)	$x + 248 = (3)^2 \times x$ or equivalent **OR** $\frac{248}{20} \times 2.5$ (K2) **OR** $\frac{248}{32} \times 4$ (K2) Note: 1. 8 *or* $\frac{1}{8}$ seen **OR** $\frac{248}{20}$ **OR** $\frac{248}{32}$ award K1
		31

Scanned with CamScanner

8(a) Transformation **N** is a translation $\begin{pmatrix} -1 \\ -4 \end{pmatrix}$

Transformation **M** is a rotation of 90° clockwise about the centre (-1, 2)

*Penjelmaan **N** ialah satu translasi* $\begin{pmatrix} -1 \\ -4 \end{pmatrix}$

*Penjelmaan **M** ialah satu putaran 90° ikut arah jam pada pusat* (-1, 2)

State the coordinates of the image of point (3, -2) under each of the following transformations:

Nyatakan koordinat imej bagi titik (3, - 2) *di bawah penjelmaan berikut:*

(i) $\mathbf{N^2}$

(ii) **NM**

MELAKA

[4 marks/4 *markah*]

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(b) (i) Diagram 11 .1 shows three quadrilaterals *ABCD*, *KLMN* and *PQRS*, drawn on a Cartesian plane.

Rajah 11.1 *menunjukkan tiga segiempat ABCD, KLMN dan PQRS, dilukis pada suatu satah Cartes.*

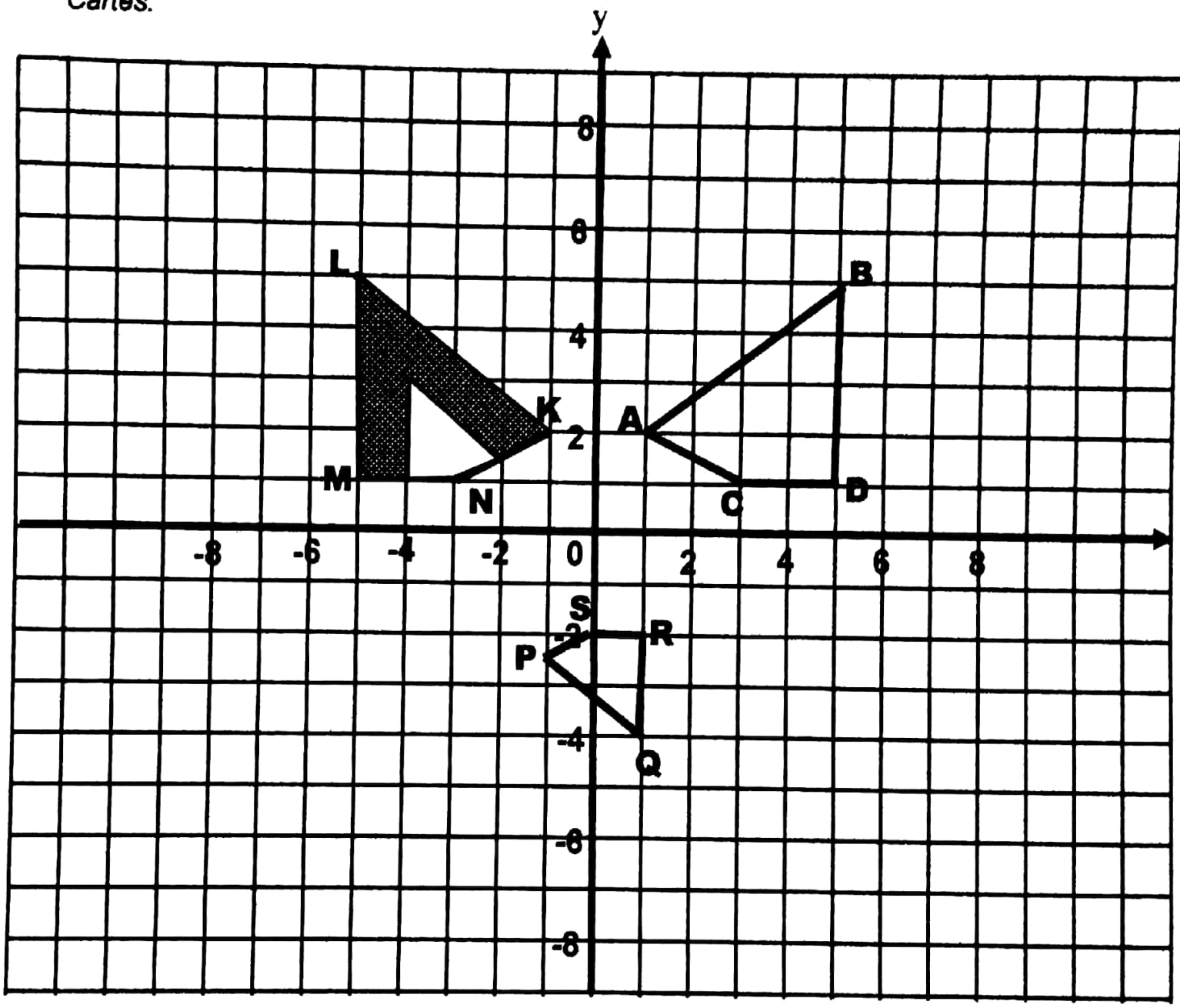

Diagram 11.1 / *Rajah* 11.1

KLMN is the image of *ABCD* under transformation *U*. *PQRS* is the image of *KLMN* under transformation *V*. Describe in full, the transformation:

KLMN ialah imej bagi ABCD di bawah penjelmaan U. PQRS ialah imej bagi KLMN di bawah penjelmaan V. Huraikan selengkapnya penjelmaan:

(a) **U**

(b) **V**

MELAKA

(ii) Given that the area of **PQRS** is 12cm^2, calculate the area, in cm^2, *of the shaded region.*

Diberi bahawa luas bagi PQRS ialah 12 cm^2, *hitung luas, dalam cm^2, kawasan berlorek.*

Scanned with CamScanner

13(a)	(i) (1, -10)
	Note: (2, -6) seen, award 1 mark
	(ii) (-6, -6)
	Note:(-5, -2) seen, award 1 mark
(b)(i)	(a) Reflection in line y – axis or equivalent
	Note:Reflection only, award 1 mark
	(b)Enlargement, scale factor, $-\frac{1}{2}$, centre (-1, -1)
	Note:1. Enlargement, scale factor $-\frac{1}{2}$,or Enlargement, centre (-1, -1), award 2 marks.
	2. Enlargement only, award 1 mark.
(ii)	$\frac{12}{\left(\frac{1}{2}\right)^2} - 12$
	Note: $\frac{12}{*\left(\frac{1}{2}\right)^2}$ award 1 mark
	36

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Diagram 10 shows three quadrilaterals *JKLM*, *PQRS* and *TUVW* on a Cartesian plane.

Rajah 10 menunjukkan tiga buah sisiempat JKLM, PQRS dan TUVW pada suatu satah Cartes.

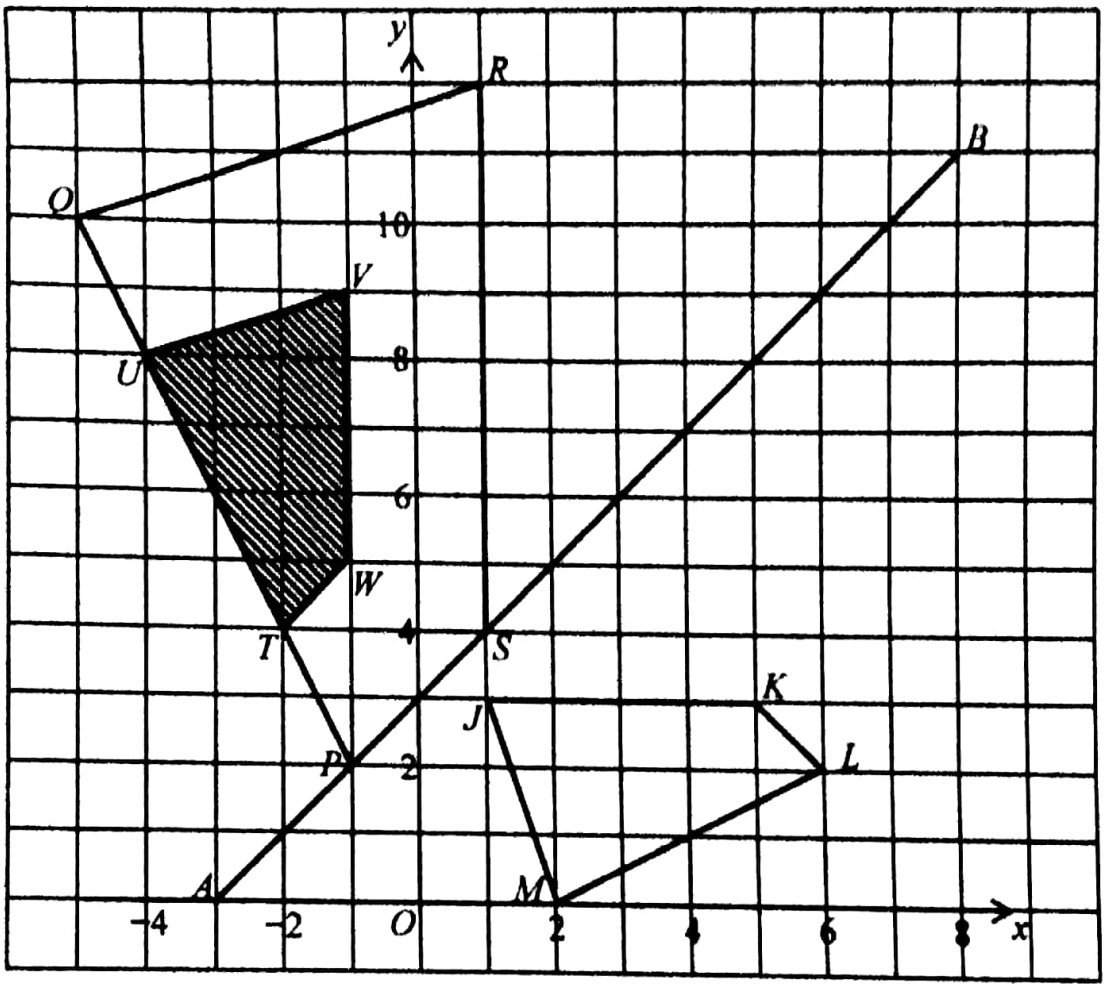

Diagram 10 / *Rajah* 10

Transformation **T** is the translation $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$

Penjelmaan **T** *ialah translasi* $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$

TERENGGANU (TRIAL)

Tranformation **V** is a reflection in the line *AB*

Penjelmaan **V** *ialah pantulan pada garis AB*

(a) State the coordinates of the image of point *K* under each of the following transformations:

Nyatakan koordinat imej titik K di bawah setiap penjelmaan berikut:

(i) **T**

(ii) **TV**

[3 *marks*]
[3 *markah*]

Scanned with CamScanner

(*b*) *PQRS* is the image of *JKLM* under transformation **GL**.
PQRS ialah imej bagi JKLM di bawah penjelmaan **GL**.

(i) Describe in full the transformation
Huraikan selengkapnya penjelmaan

(a) **L**.

(b) **G**.

TERENGGANU (TRIAL)

(ii) Given that the region *TUVW* represents a region of area 100 m^2. Calculate area, in m^2, region represents by unshaded region *QRSPTWVU*.

Diberi bahawa rantau TUVW mewakili suatu kawasan yang mempunyai luas 100 m^2. *Hitungkan luas, dalam* m^2 , *kawasan yang diwakili oleh kawasan tidak berlorek QRSPTWVU.*

[9 *marks*]
[9 *markah*]

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(i) (8, 1)

(ii) (3, 6)

Note :
(3, 6) is marked on the diagram *or* (0, 8) is seen *or* (0, 8) is marked on the marked on the diagram, award P1

(i) L = Rotation, centre (3, 7) , 90° clockwise //

Putaran, pusat (3, 7) , 90° *ikut arah jam*

Note:
1. Rotation, centre (3, 7) *or* Rotation, 90° clockwise // *Putaran, pusat* (3, 7) *atau Putaran*, 90° *ikut arah jam*, award P2
2. Rotation // *Putaran* award P1

G = Enlargement, scale factor 2, centre (–3, 6) //
Pembesaran, faktor skala 2, *pusat* (–3, 6)

Note:
1. Enlargement, scale factor 2 // *Pembesaran, faktor skala* 2, award P2
2. Enlargement, centre (–3, 6) // *Pembesaran, pusat O* (–3, 6), award P2
3. Enlargement // *Pembesaran*, award P1

(ii) $*(2)^2 \times 100 - 100$

$*(2)^2 \times 100$ award K1

300

Scanned with CamScanner

(a) Diagram 13.1 shows point $E(-3,1)$ marked on a Cartesian plane.

Rajah 13.1 *menunjukkan titik* $E(-3,1)$ *ditanda pada suatu satah Cartes.*

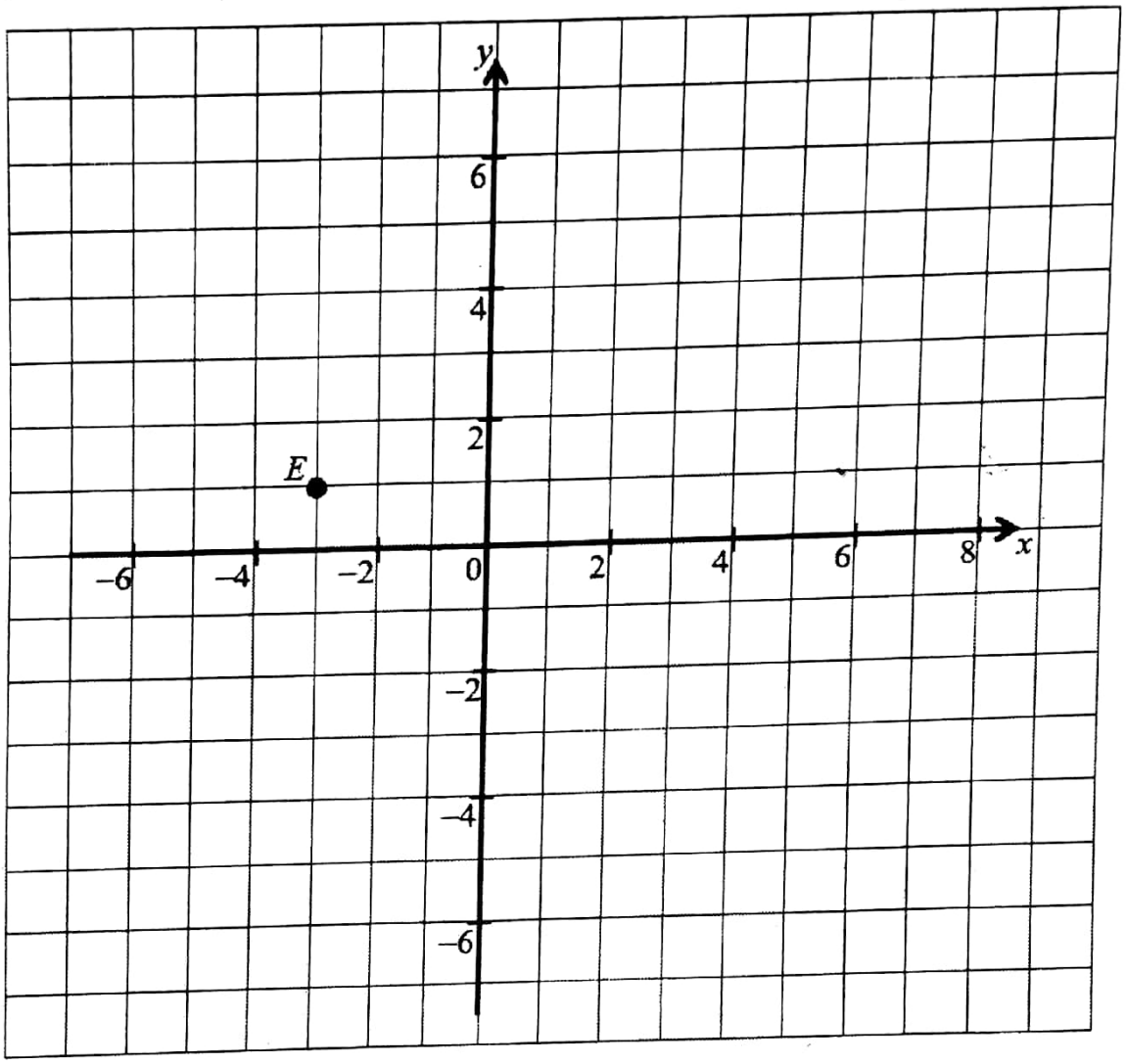

Diagram / *Rajah* 13.1

Transformation **T** is a translation $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$. Transformation **R** is an anticlockwise rotation 90^0 about the centre (0 , 4). Transformation **P** is an enlargement with scale factor 2 about the centre (−1 , 0).

Penjelmaan **T** *ialah translasi* $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$. *Penjelmaan* **R** *ialah satu putaran* 90^0 *lawan arah jam pada pusat* (0 , 4). *Penjelmaan* **P** *ialah pembesaran dengan faktor skala 2 pada pusat* (−1 , 0).

State the coordinates of the image of point E under the following transformations:

Nyatakan koordinat imej bagi titik E di bawah penjelmaan berikut :

(i) **TP**,

(ii) **PR**.

PULAU PINANG

[4 marks / *markah*]

Scanned with CamScanner

(b) Diagram 13.2 shows three quadrilaterals, *ABCD*, *JKLM* and *PQLR* drawn on a Cartesian plane.
Rajah 13.2 *menunjukkan tiga buah sisi empat, ABCD, JKLM dan PQLR dilukis pada satah Cartes.*

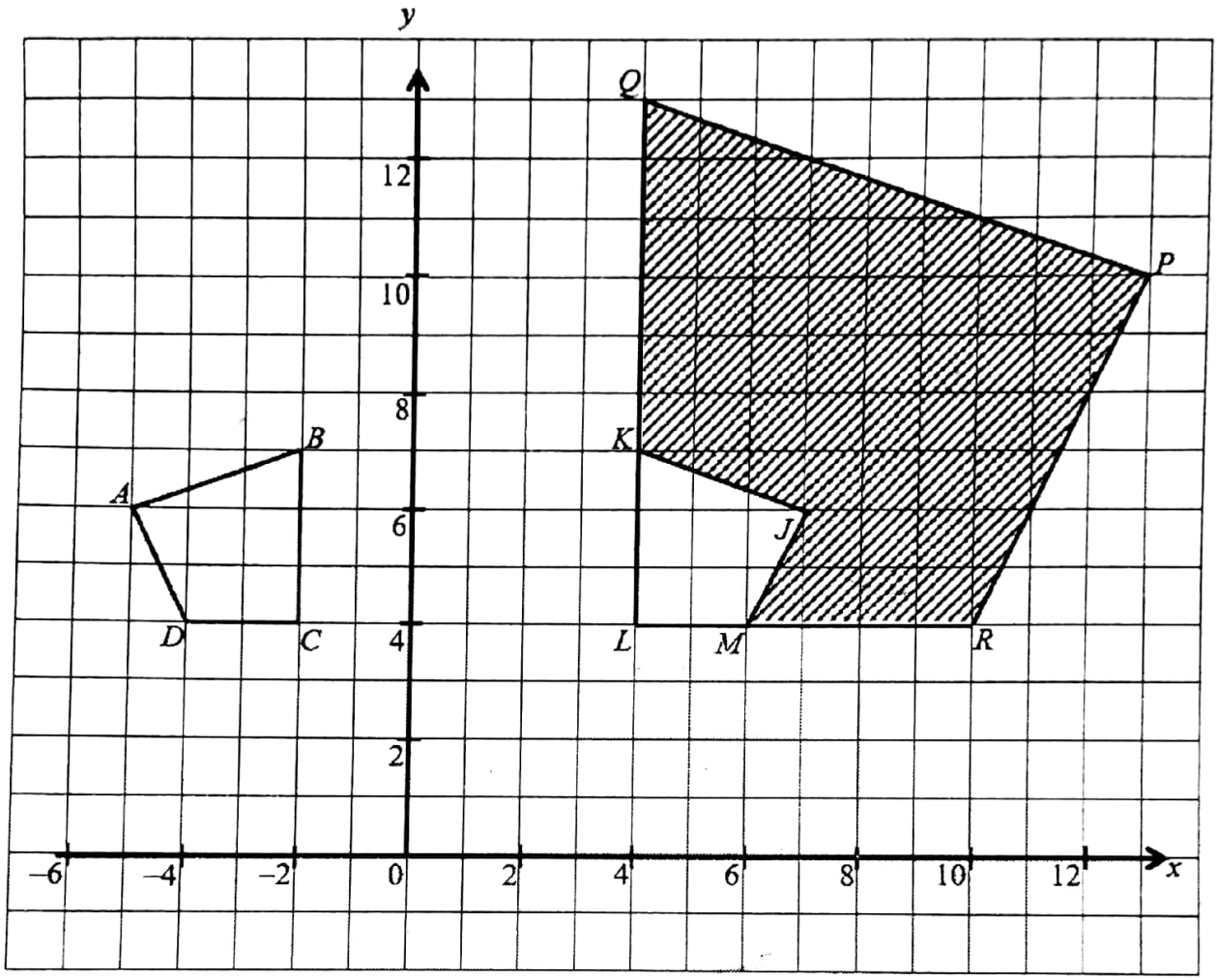

Diagram / *Rajah* 13.2

(i) *PQLR* is the image of *ABCD* under the combined transformation **WV**. Describe in full, the transformation:
PQLR ialah imej ABCD di bawah gabungan penjelmaan **WV**. *Huraikan selengkapnya penjelmaan :*
(a) **V**,
(b) **W**.

PULAU PINANG

[5 marks / *markah*]

(ii) Given *ABCD* represents a region of area 30 cm^2, calculate the area, in cm^2, of the shaded region.
Diberi ABCD mewakili suatu kawasan yang mempunyai luas 30 cm^2, *hitung luas, dalam* cm^2, *kawasan berlorek.*

[3 marks / *markah*]

Scanned with CamScanner

13 (a) (i) (−2 , −2)

Note: (−5 , 2) seen, award P1

(ii) (7 , 2)

Note: (3 , 1) seen, award P1

(b) (i) (a) **V** = Relection, line $x = 1$.

V = *Pantulan, garis* $x = 1$.

(b) **W** = Enlargement, scale factor 3, centre L.

W = *Pembesaran, faktor skala* 3, *pusat* L.

(ii) $3^2 \times 30$

$270 - 30$

240

Scanned with CamScanner

Diagram 9.1 shows point M on a Cartesian plane.

Rajah 9.1 menunjukkan titik M pada suatu satah Cartes.

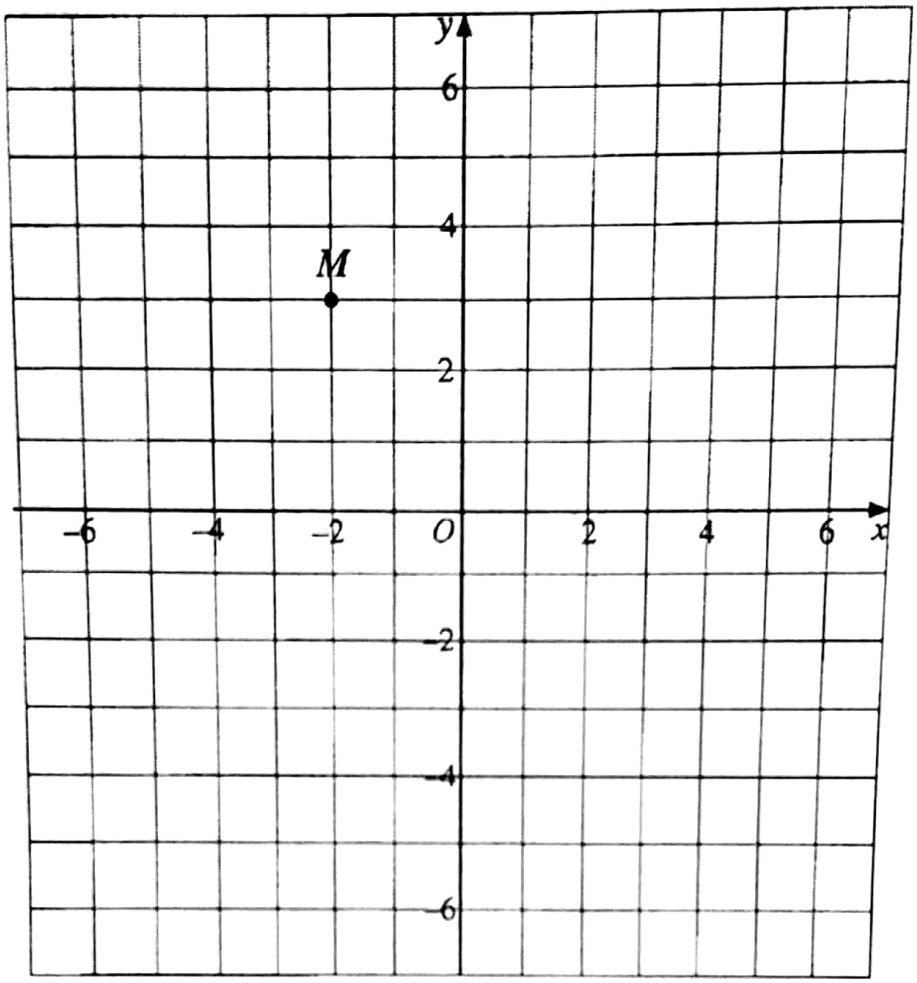

Diagram 9.1
Rajah 9.1

PAPER JUN 2020

(*a*) Transformation **T** is a translation $\begin{pmatrix} 7 \\ -2 \end{pmatrix}$.

Transformation **P** is a reflection in the line $y = x$.

Transformation **R** is an anticlockwise rotation of 90° about the origin.

State the coordinates of the image of point M under the following transformations:

Penjelmaan **T** *ialah satu translasi* $\begin{pmatrix} 7 \\ -2 \end{pmatrix}$.

Penjelmaan **P** *ialah satu pantulan pada garis* $y = x$.

Penjelmaan **R** *ialah putaran* 90°, *arah lawan jam pada asalan.*

Nyatakan koordinat imej bagi titik M di bawah penjelmaan berikut:

(i) **PT**,

(ii) **TR**.

[4 *marks*]
[4 *markah*]

Scanned with CamScanner

(*b*) Diagram 9.2 shows three irregular hexagons, *ABCDEF*, *GHCJEK* and *LMHGKN*, drawn on a Cartesian plane.

Rajah 9.2 menunjukkan tiga heksagon tak sekata, ABCDEF, GHCJEK dan LMHGKN, yang dilukis pada suatu satah Cartes.

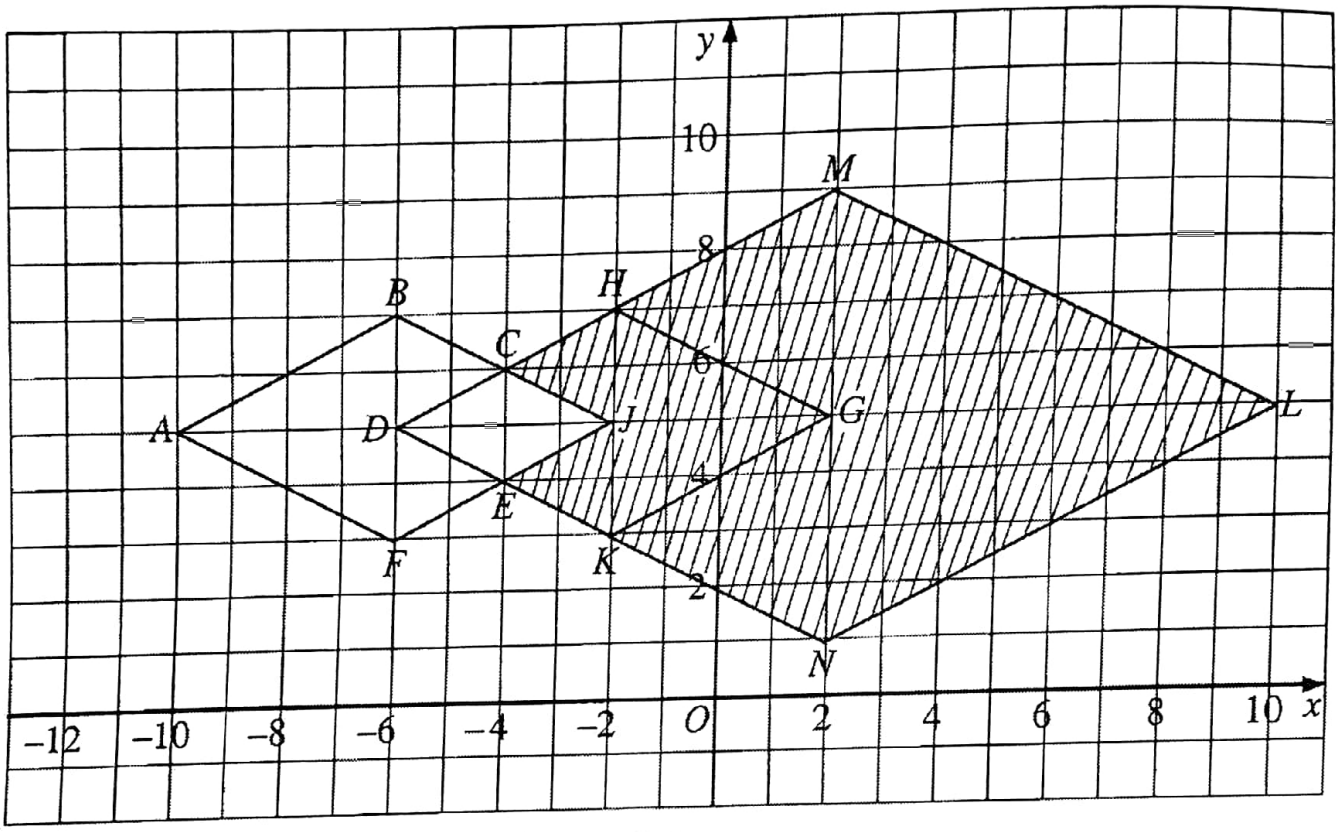

Diagram 9.2
Rajah 9.2

(i) *LMHGKN* is the image of *ABCDEF* under a combined transformation **WV**.
Describe in full the transformation:

LMHGKN ialah imej bagi ABCDEF di bawah gabungan penjelmaan **WV**.
Huraikan selengkapnya penjelmaan:

(*a*) **V**,
(*b*) **W**.

PAPER JUN 2020

(ii) It is given hexagon *LMHGKN* represents a region with an area of 168 cm^2.
Calculate the area, in cm^2, of the shaded region.

Diberi bahawa heksagon LMHGKN mewakili suatu kawasan yang mempunyai luas 168 cm^2.
Hitung luas, dalam cm^2, *kawasan yang berlorek.*

[8 *marks*]
[8 *markah*]

Scanned with CamScanner

(a) (i) $(5, 1) \longrightarrow (1, 5)$

(ii) $(-3, -2) \longrightarrow (4, -4)$

(b) (i) a) V = Pantulan pada garis $x = -4$ @ *Garis CE*

b) W = Pembesaran dengan faktor skala 2 pada pusat D/(–6, 5)

(ii) Luas imej *LMHGKN*, $168 = (2)^2 \times$ Luas objek

Maka, Luas objek = 42

□ Luas kawasan berlorek = $168 + 42 = 210\ cm^2$

Scanned with CamScanner

Diagram 6 shows three trapezium *JKLM, PQRS* and *TUVW* on a Cartesian plane.
Rajah 6 menunjukkan tiga trapezium JKLM, PQRS dan TUVW pada suatu satah Cartes.

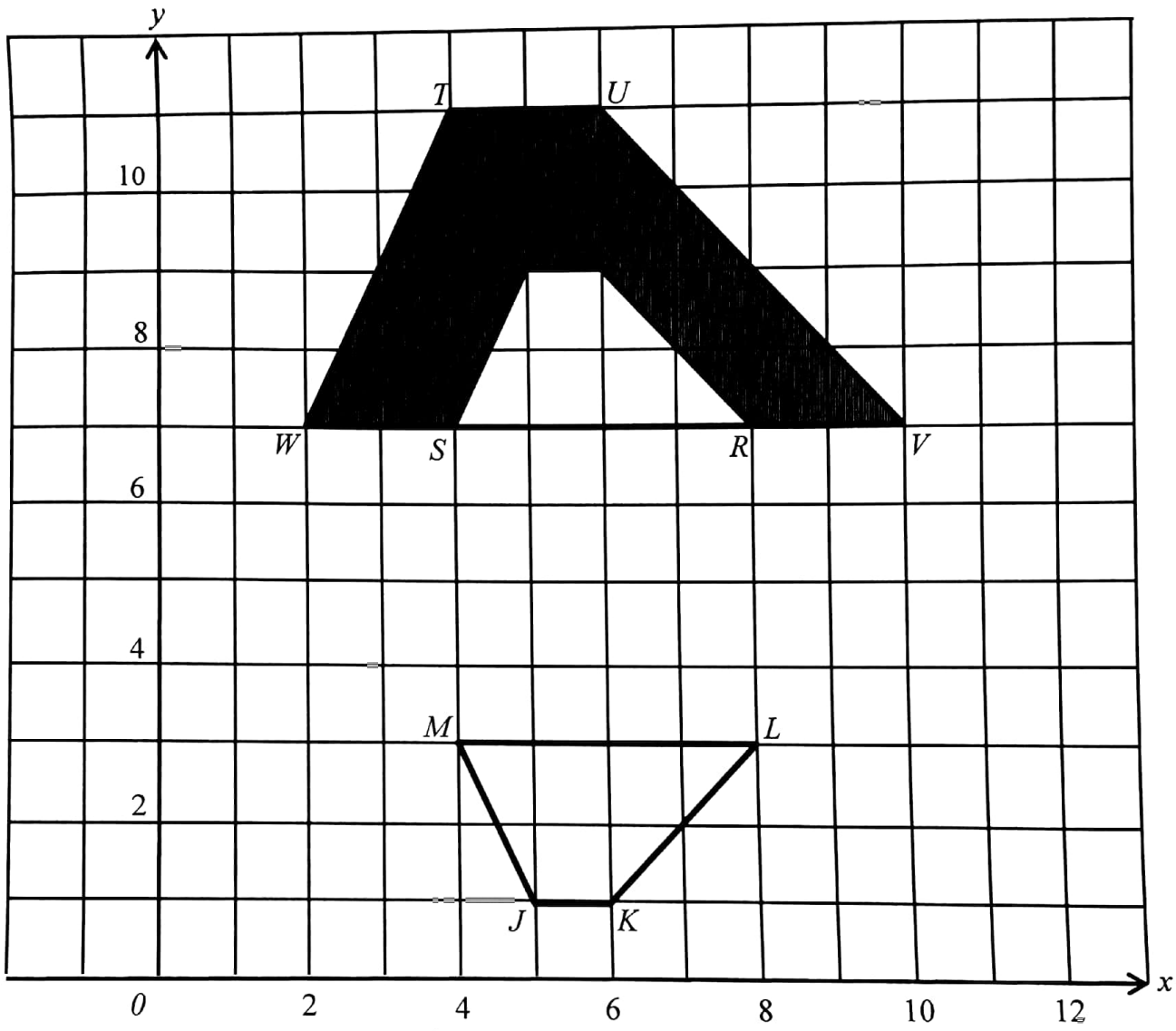

Diagram 6/ *Rajah 6*

Transformation **T** is the translation $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

Penjelmaan **T** *ialah translasi* $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

TERENGGANU

Tranformation **V** is a reflection in the line $x = 6$

Penjelmaan **V** *ialah pantulan pada garis* $x = 6$

(a) State the coordinates of the image of point M under each of the following transformations:

Nyatakan koordinat imej titik M di bawah setiap penjelmaan berikut:

(i) $\mathbf{T^2}$

(ii) **TV**

[4 *marks*]
[4 *markah*]

Scanned with CamScanner

(b) *TUVW* is the image of *JKLM* under transformation **WU**.
TUVW ialah imej bagi JKLM di bawah penjelmaan **WU**.

(i) Describe in full the transformation
Huraikan selengkapnya penjelmaan

(a) **U**.

(b) **W**.

TERENGGANU

(ii) Given that the shaded region *TUVRQPSW* represents a region of area 144 m^2. Calculate the area, in m^2, of the region represented by *PQRS*.

Diberi bahawa rantau berlorek TUVRQPSW mewakili suatu kawasan yang mempunyai luas 144 m^2. *Hitungkan luas, dalam* m^2, *kawasan yang diwakili oleh PQRS*.

[8 *marks*]
[8 *markah*]

Scanned with CamScanner

13(a) (i) (0, 9)

Note:
(0, 9) is marked on the diagram *or* (2, 6) is seen *or* (2, 6) is marked on the marked on the diagram, award P1

(ii) (6, 6)

Note:
(6, 6) is marked on the diagram *or* (8, 3) is seen *or* (8, 3) is marked on the marked on the diagram, award P1

(b) (i) V = Reflection at straight line $y = 5$ //
Pantulan pada garis lurus $y = 5$

Note:
Reflection // *Pantulan* award P1

W = Enlargement, scale factor 2, centre (6, 7) //
Pembesaran, faktor skala 2, *pada pusat* (6, 7)

Note:
Enlargement, scale factor 2 // *Pembesaran, faktor skala* 2, award P2
Enlargement, centre (6, 7) // *Pembesaran, pada pusat* (6, 7), award P2
Enlargement // *Pembesaran*, award P1

(ii) $144 + LO = (2^*)^2 \times LO$

Note:
$LI = (2^*)^2 \times LO$ seen, award K1

Scanned with CamScanner

Transformation **Q** is a reflection in the line $y = x$.

Transformation **T** is a translation $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$

Penjelmaan **Q** *mewakili satu pantulan pada garis lurus* $y = x$.

Penjelmaan **T** *mewakili satu translasi* $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$

State the coordinates of the image of the point (-2 , 6) under each of the following transformations :

Nyatakan koordinat imej bagi titik (-2 , 6) *di bawah setiap penjelmaan berikut*:

(i) **T**

(ii) **Q T.**

JOHOR (1)

[3 *marks*]

[3 *markah*]

Scanned with CamScanner

(8) Diagram 9 shows three polygon, *ABCDE, JKLMN* and *PQRST* drawn on a Cartesian plane.

Rajah 9 menunjukkan tiga buah poligon ABCDE, JKLMN dan PQRST, dilukis pada satah Cartesian.

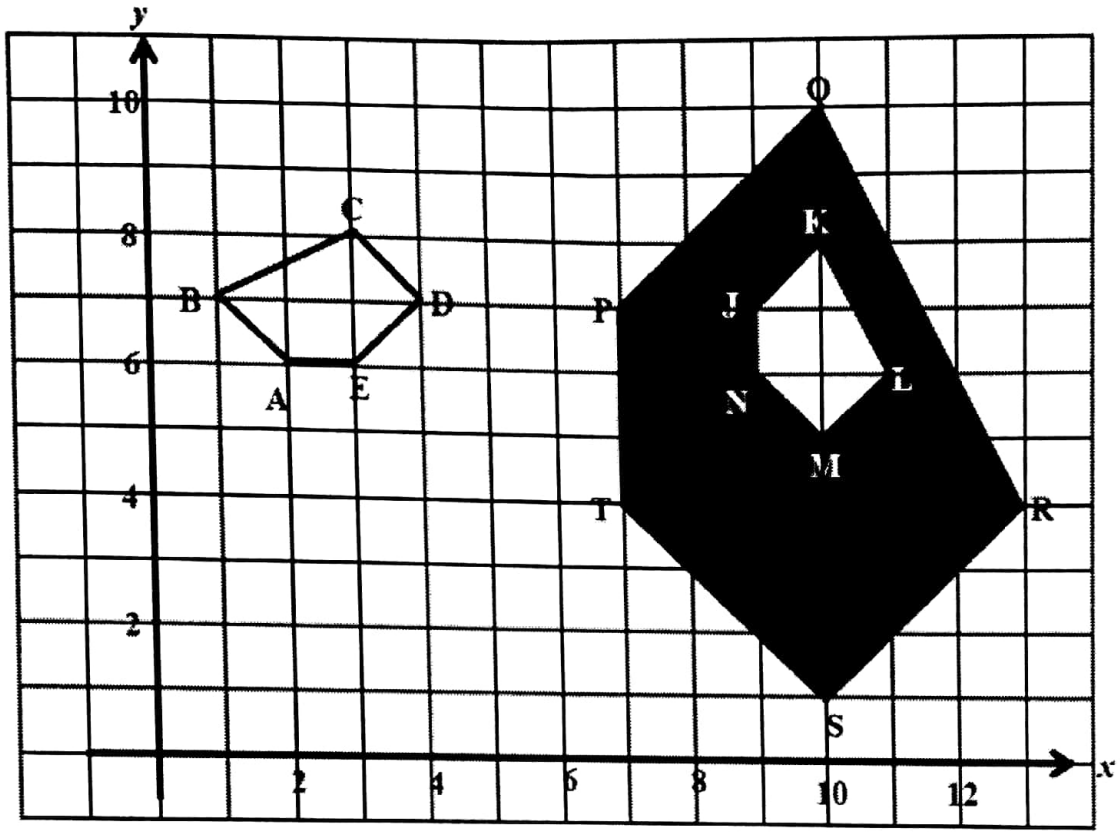

Diagram 9 / *Rajah 9*

(i) *JKLMN* is the image of *ABCDE* under the transformation **M** and *PQRST* is the image of *JKLMN* under the transformation **N.**

JKLMN ialah imej bagi ABCDE di bawah penjelmaan **M** dan *PQRST ialah imej bagi JKLMN di bawah penjelmaan* **N**.

Describe in full the transformation :

Huraikan selengkapnya penjelmaan :

(a) **M,**

(b) N

JOHOR (1)

(ii) If the area of polygon *ABCDE* is 16 m^2, calculate the area of the shaded region.

Jika luas poligon ABCDE ialah 16 m^2, *hitungkan luas kawasan berlorek.*

[9 *marks*

[9 *markah*

Scanned with CamScanner

a) i) (-8 , 8)

ii) (8 , -8)
(-8 , 8) seen award P1

b) i) **M** : Rotation, 90° clockwise, about centre (6 , 3)
M *: Putaran , 90° ikut arah jam , pada pusat (6 , 3)*

N : Enlargement with scale factor of 3 about centre (10 , 7)
N *: Pembesaran dengan faktor skala 3 pada pusat* (10 ,7)

(ii) Area of image/ *Luas imej*
$= k^2 \times$ Area of object
$= 3^2 \times 16$
$= 144\ m^2$

Area of shaded region/*Luas kawasan berlorek*
$= 144 - 16$
$= 128\ m^2$

Scanned with CamScanner

(a) Transformation **T** is a translation $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$.

Transformation **R** is an anticlockwise rotation of $90°$ about the centre (1, 0).

Penjelmaan **T** *mewakili satu translasi* $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$

Penjelmaan **R** *mewakili satu putaran melalui sudut* $90°$ *lawan arah jam pada pusat (1 , 0).*

State the coordinates of the image of the point (5, 1) under each of the following transformations :

Nyatakan koordinat imej bagi titik (5 , 1) di bawah setiap penjelmaan berikut:

(i) **R**

(ii) $\mathbf{T}^2$.

JOHOR (2)

[3 marks]
[3 *markah*]

Scanned with CamScanner

b) Diagram 8 shows three hexagon *ABCDEF, GHIJKL and GNMPRS* drawn on a Cartesian plane.
Rajah 8 menunjukkan tiga buah sisi enam ABCDEF, GHIJKL dan GNMPRS dilukis di atas satah Cartesan.

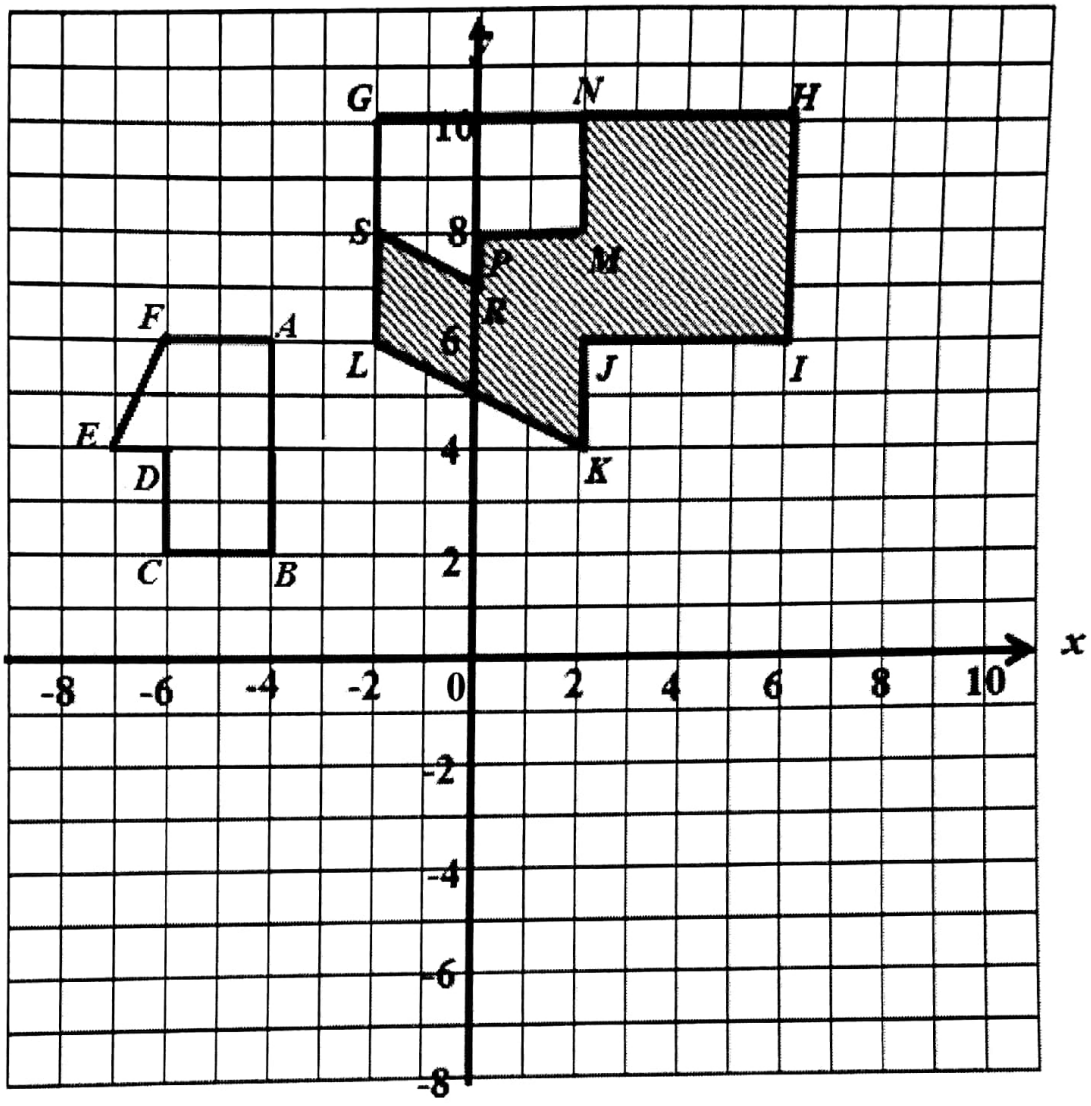

Diagram 8 / *Rajah 8*

(i) *GHIJKL* is the image of *ABCDEF* under the combined **UV**.
GHIJKL ialah imej bagi ABCDEF di bawah gabungan penjelmaan **UV.**
Describe in full the transformation
Huraikan selengkapnya penjelmaan
(a) **V**,
(b) **U**

JOHOR (2)

(ii) If the area of triangle *ABCDE* is 130 cm^2, calculate the area of the shaded region.
Jika luas segitiga ABCDE ialah 130 cm^2, *hitungkan luas kawasan berlorek.*

[9 marks]
[*9 markah*]

Scanned with CamScanner

a) i) (0 , 4)

ii) (-3 , 5)
(1 , 3) seen award P1

b) i) **V** : Rotation, 90° anticlockwise, about centre (- 5 , 9)
V : Putaran , 90° lawan arah jam, pada pusat (- 5 ,9)

U : Enlargement with scale factor of 2 about centre (-2 , 10)
U : Pembesaran dengan faktor skala 2 pada pusat (-2 , 10)

(ii) Area of image/ *Luas imej*
$= 2^2 \times$ Area of object
$= 2^2 \times 130$
$= 520\ m^2$

Area of shaded region / *Luas kawasan berlorek*
$= 520 - 130$
$= 390\ m^2$

Scanned with CamScanner

(a) Given X is a reflection in the line y = x and Y is an anticlockwise rotation of 90^0 abou the centre (2,2). Determine the coordinates of the image of point (4, 3) under each combined transformation below.

Diberi **X** *ialah pantulan pada garis* $y = x$ *dan* **Y** *ialah putaran* 90° *lawan arah jam pada pusat (2, 2). Tentukan koordinat imej bagi titik* (4, 3) *di bawah setiap gabungan penjelmaan yang berikut.*

KELANTAN

(i) Y^2

(ii) X^2

[3 marks / *3 markah*]

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(b) Diagram shows trapezium ABCD, EFGH, and JKLM,drawn on a Cartesian plane.

Rajah menunjukkan sebuah trapeziumABCD, EFGH, dan JKLM, dilukis di satah Cartesan.

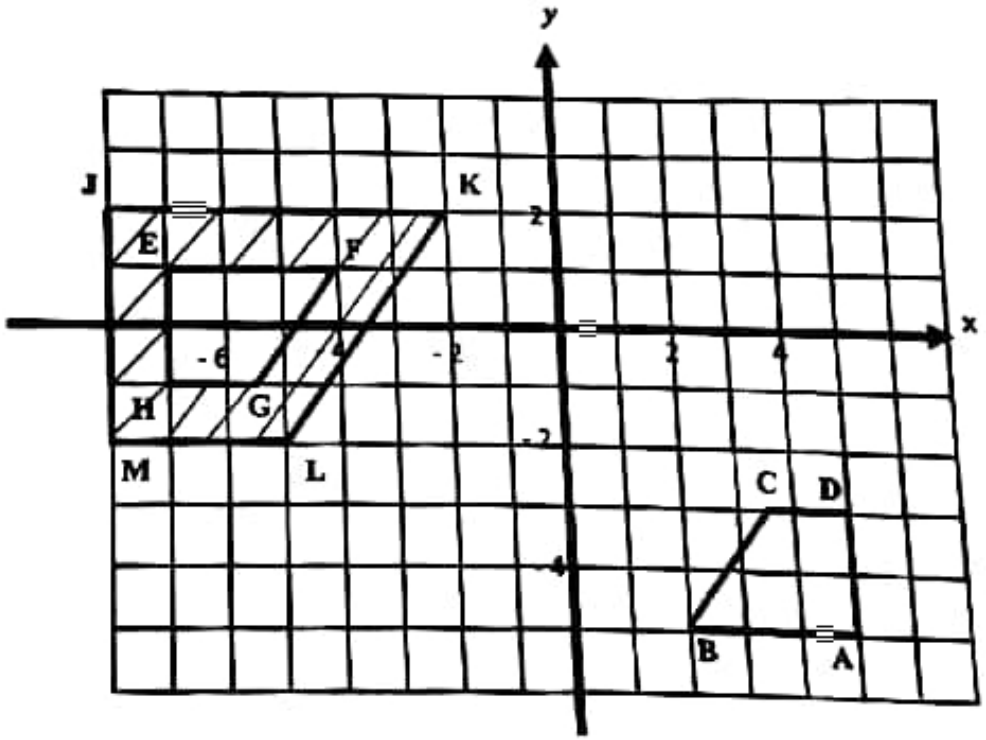


Diagram 7 / *Rajah 7*

EFGH is the image of JKLM under the transformation of P. While ABCD is the image of EFGH under transformation of Q.

EFGH ialah imej bagi JKLM di bawah penjelmaan P, manakala ABCD ialah imej bagi EFGH di bawah penjelmaan Q. Huraikan selengkapnya :

(i) Tranformation P/*Penjelmaan P*

(ii) (ii) Transformation Q/Penjelmaan Q

[6 marks/ *6 markah*]

(c) Given a shaded area of 60 cm^2. Calculate the area, in cm^2, JKLM.

Diberi luas kawasan berlorek ialah 60 cm^2. Hitung luas, dalam cm^2, JKLM.

[3 marks / *3 markah*]

KELANTAN

Scanned with CamScanner

(a)i-	(0, 1)
ii-	(4, 3)
(b)i-	P = Pembesaran, $k = \frac{1}{3}$, pusat (-6, 0)
ii-	Q = Putaran, 180° lawan arah ikut arah jam, pada pusat (-1, -2)
(c)	$x = (\frac{1}{3})^2 \times (60 + x)$
	$x = 20$
	JKLM = 20 + 60 = 80

Scanned with CamScanner

(*a*) Diagram 10.1 shows point P on a Cartesian plane.
Rajah 10.1 *menunjukkan titik P pada suatu satah Cartes.*

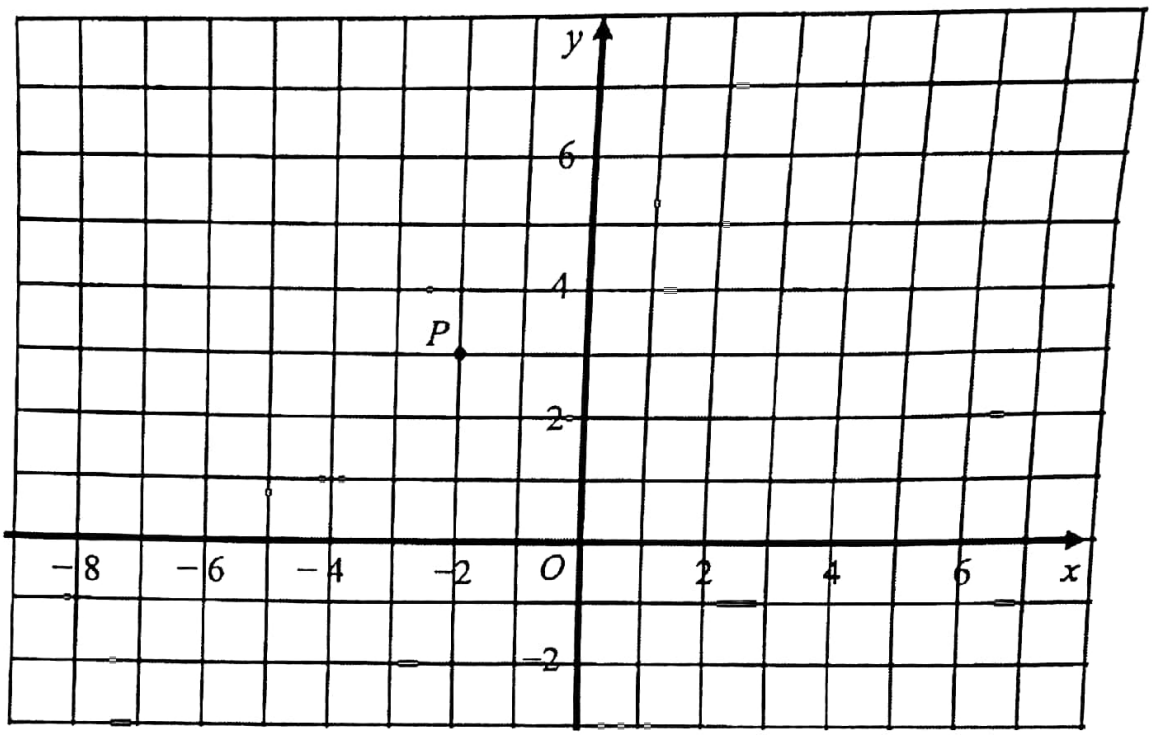


Diagram 10.1
Rajah 10.1

Transformation **A** represents a reflection along y-axis.

Transformation **B** represents a translation $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$.

Transformation **C** represents a rotation of 90° in the clockwise direction about the point $(-4, 2)$.

State the coordinates of the image of point $P(-2, 3)$ under the following transformation :

Penjelmaan **A** *mewakili satu pantulan pada paksi-y.*

Penjelmaan **B** *mewakili translasi* $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$.

Penjelmaan **C** *mewakili putaran* 90° *mengikut arah jam pada titik* $(-4, 2)$.

Nyatakan koordinat imej bagi titik $P(-2, 3)$ *di bawah penjelmaan* :

(i) **BA,**

NEGERI SEMBILAN

(ii) **CB.**

[4 *marks*]
[4 *markah*]

Scanned with CamScanner

(*b*) Diagram 10.2 shows the geometrical shape *ABCD* and *EFGH*.
Rajah 10.2 *menunjukkan bentuk geometri ABCD dan EFGH.*

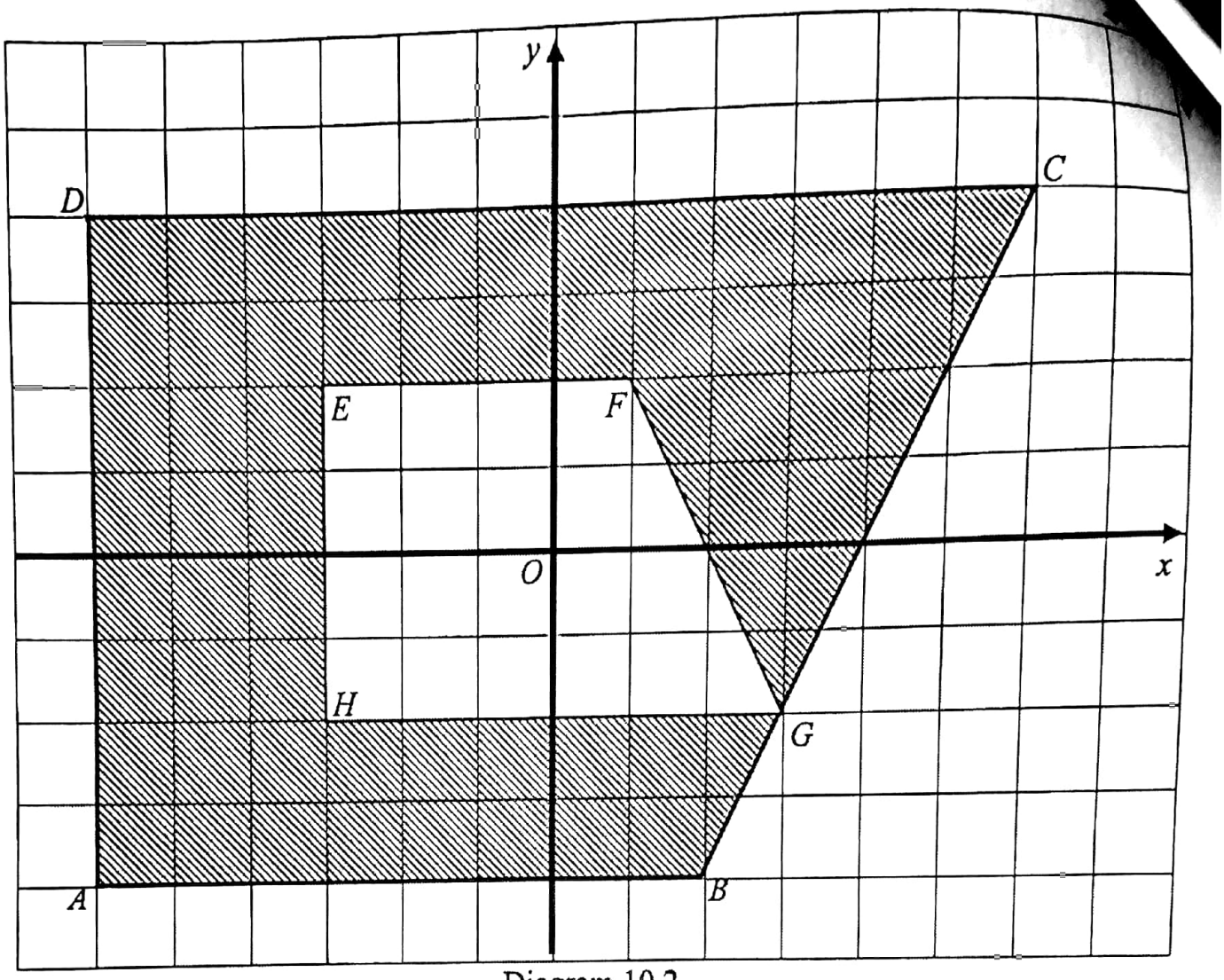


Diagram 10.2
Rajah 10.2

EFGH is the image of *ABCD* under transformation **V** followed by transformation **W**.
Describe in full the transformation :

EFGH ialah imej bagi ABCD di bawah penjelmaan **V** *dan* **W**.

(i) **V**,

(ii) **W**.

NEGERI SEMBILAN

[5 *marks*]
[5 *markah*]

(*c*) Calculate the area, in unit^2, of the shaded region.

Kirakan luas, dalam unit^2, *kawasan berlorek.*

[3 *marks*]
[3 *markah*]

Scanned with CamScanner

(a)(i) (−1, 5)

Note:
(−1, 5), (2, 3) seen or marked, award P1

(ii)
(−1, 3)

Note:
(−1, 3), (−5, 5) seen or marked, award P1

(b)(i) Reflection along x-axis

Note:
1. Reflection, award P1

(ii) Enlargement, scale factor $\frac{1}{2}$, centre O

Note:
1. Enlargement, award P1
2. Enlargement, scale factor $\frac{1}{2}$ or Enlargement, centre O, award P2
3. Accept the answers (b)(ii) for (b)(i) and (b)(i) for (b)(ii).

(c) $\frac{1}{2} \times (4 + 6) \times 4$ or $\frac{1}{2} \times (8 + 12) \times 8$

$\frac{1}{2} \times (8 + 12) \times 8 - \frac{1}{2} \times (4 + 6) \times 4$ OR $80 - \left(\frac{1}{2}\right)^2 \times 80$

60

Scanned with CamScanner

(a) Transformation Q is a rotation 90° clockwise at point (0 , 6)

Transformation **T** is a translation $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$

Penjelmaan **P** *mewakili satu putaran* 90° *ikut arah jam pada titik* (0 , 6)

Penjelmaan **T** *mewakili satu translasi* $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$

State the coordinates of the image of the point (2 , 8) under each of the following transformations :

Nyatakan koordinat imej bagi titik (2 , 8) *di bawah setiap penjelmaan berikut*:

JOHOR 7

(i) Q T

(ii) T Q.

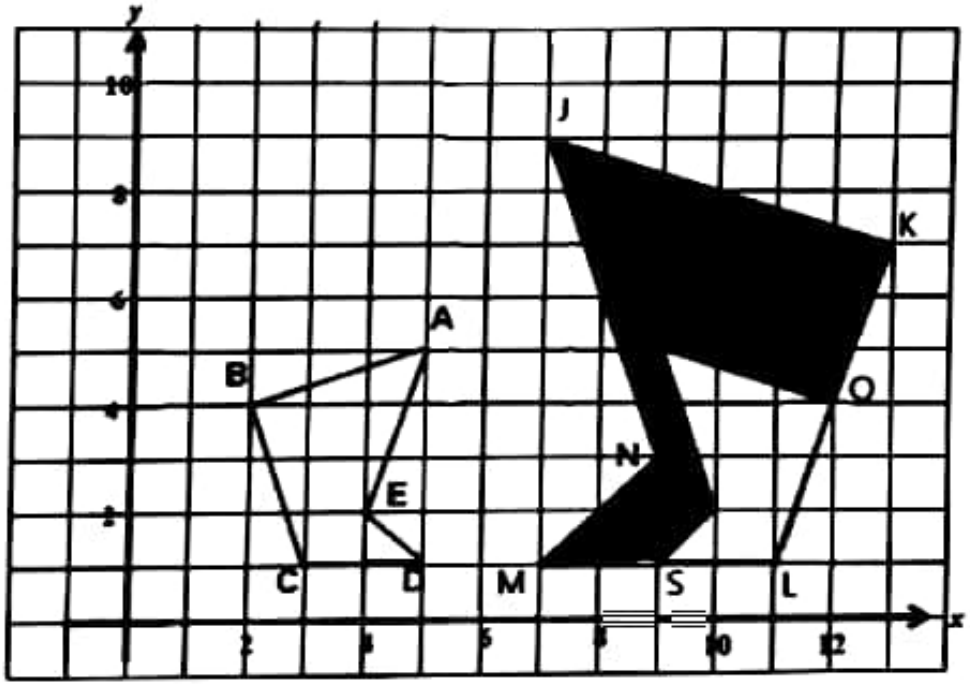
[3 *marks*/3 *markah*

Scanned with CamScanner

JOHOR 7

(b) Diagram 8 shows three polygon, *ABCDE,JKLMN dan PQRST* drawn on a Cartesian plane.

Rajah 8 menunjukkan tiga buah poligon ABCDE, JKLMN dan PQRST , dilukis pada Satah Cartesian.



(i) *PQLST* is the image of *ABCDE* under the transformation **M** and *JKLMN* is the image of *PQLST* under the transformation **N**.

PQLST ialah imej bagi ABCDE di bawah penjelmaan **M** dan *JKLMN ialah imej bagi PQLST di bawah penjelmaan* **N**.

Describe in full the transformation :

Huraikan selengkapnya penjelmaan :

(a) **M**,

(b) **N**

(ii) If the area of polygon *ABCDE* is 24 cm^2, calculate the area of the shaded region.

Jika luas polygon ABCDE ialah 24 cm^2, *hitungkan luas kawasan berlorek.*

[9 *marks/9 markah*]

Scanned with CamScanner

a) i) (5, 2)
(4 , 11) seen award P1

ii) (4 , 7)
(2 , 4) seen award P1

b) i) **M** : Reflection in the line x = 7
M *: Pantulan pada garis x = 7*

N : Enlargement with scale factor of 2 about centre L(11,1)
N : Pembesaran dengan faktor skala 2 pada pusat L(11,1)

(ii) Area of image/ *Luas imej*
$= k^2 \times$ Area of object
$= 2^2 \times 24$
$= 96\ m^2$

Area of shaded region/Luas kawasan berlorek
$= 96 - 24$
$= 72\ m^2$

Scanned with CamScanner

4 (a) Transformation V is a rotation 90° clockwise at centre (3 , 3)

Penjelmaan V ialah putaran 90° ikut arah jam pada titik (3 , 3)

Transformation T is a translation $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$

Penjelmaan T ialah translasi $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$

State the coordinate of the image of point (5 , 5) under each of the following transformations.

Nyatakan koordinat imej titik (5 , 5) di bawah setiap penjelmaan berikut

(i) T V

(ii) V T

JOHOR 8

[3 marks
[3 *markah*]

Scanned with CamScanner

(b) Diagram 14 shows three polygon, *ABCDE,JKLMN dan JQRST* drawn on a Cartesian plane.

Rajah 14 menunjukkan tiga buah poligon ABCDE, JKLMN dan JQRST dilukis pada Satah Cartes

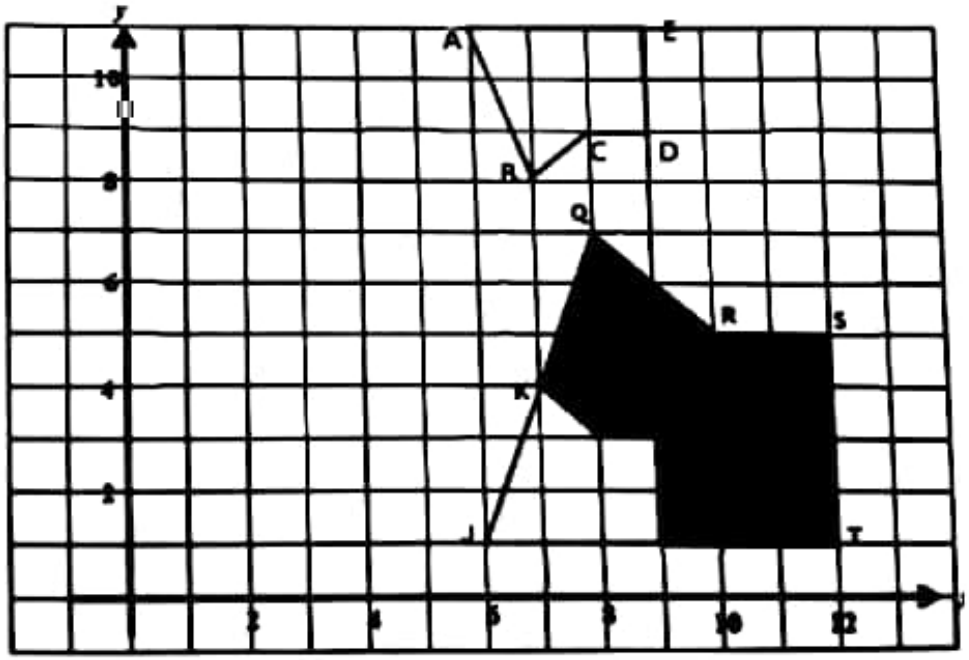


Diagram 14 / *Rajah 14*

(i) *JKLMN* is the image of *ABCDE* under the transformation **M** and *JQRST* is the image of *JKLMN* under the transformation **N**

JKLMN ialah imej bagi ABCDE di bawah penjelmaan **M** dan *JQRST ialah imej bagi JKLMN di bawah penjelmaan* **N**.

Describe in full the transformation :

Huraikan selengkapnya penjelmaan :

(a) **M**,

(b) **N**

JOHOR 8

(ii) If the area of polygon *ABCDE* is 30 cm^2, calculate the area of the shaded region.

Jika luas poligon ABCDE ialah 30 cm^2, *hitungkan luas kawasan berlorek.*

[9 *marks*]

[9 *markah*]

Scanned with CamScanner

a) i) (3 , 2)
(5 , 1) seen award P1

ii) (6,3)
(3 , 6) seen award P1

b) i) **M** : Reflection, line y = 6
M *: Pantulan pada garis* $y = 6$

N : Enlargement with scale factor of 2 about centre J(6 , 1)
N *: Pembesaran dengan faktor skala 2 pada pusat J* (6 , 1)

(ii) Area of image/ *Luas imej*
$= k^2 \times$ Area of object
$= 2^2 \times 30$
$= 120 \text{ m}^2$

Area of shaded region/Luas kawasan berlorek
$= 120 - 30$
$= 90 \text{ m}^2$

Scanned with CamScanner

(a) Diagram 13.1 shows the point $P(1, 2)$ drawn on a Cartesian plane.
Rajah 13.1 *menunjukkan titik* $P(1, 2)$ *dilukis pada suatu satah Cartesan.*

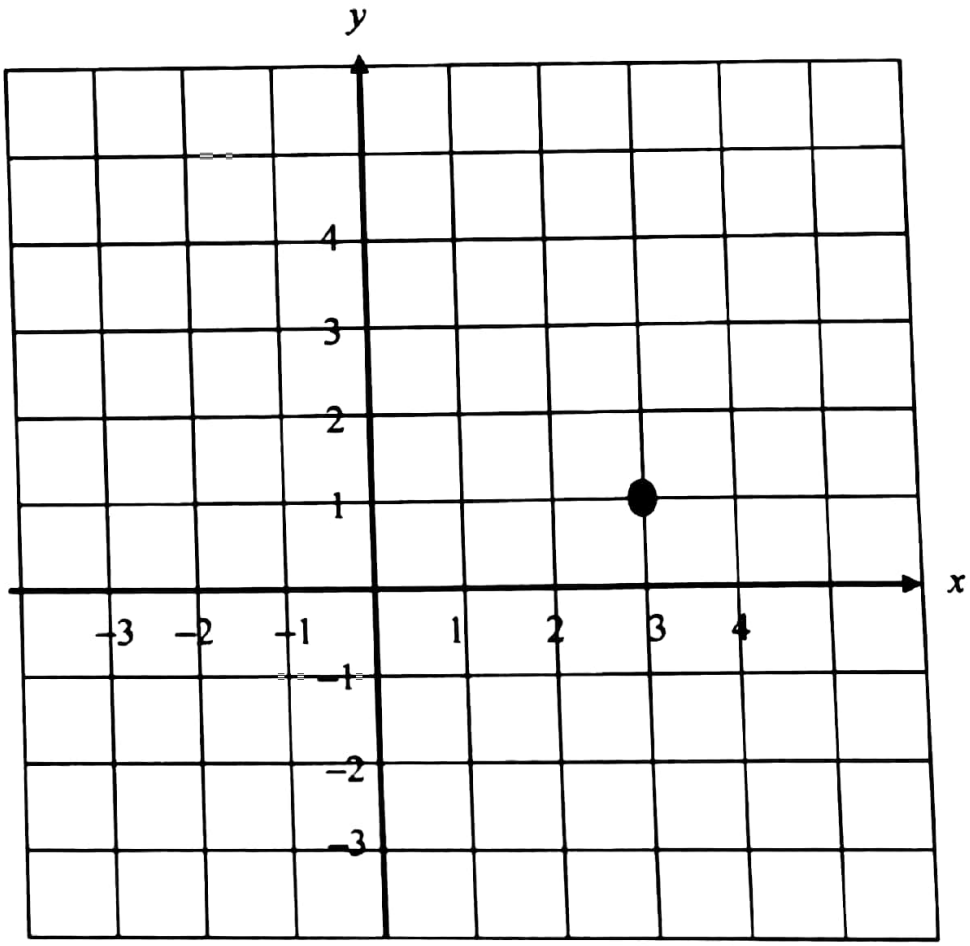


Diagram 13.1
Rajah 13.1

Transformation **R** is a reflection in the line $x = 1$ and transformation T is a translation $\begin{pmatrix} -5 \\ 2 \end{pmatrix}$.

State the coordinates of the image of point (3,1) under each of the following transformations:

Penjelmaan **R** *ialah satu pantulan pada garis* $x = 1$ *dan penjelmaan T ialah satu translasi* $\begin{pmatrix} -5 \\ 2 \end{pmatrix}$.

Nyatakan koordinat imej bagi titik (3,1) dibawah setiap penjelmaan yang berikut.

(i) **R**,

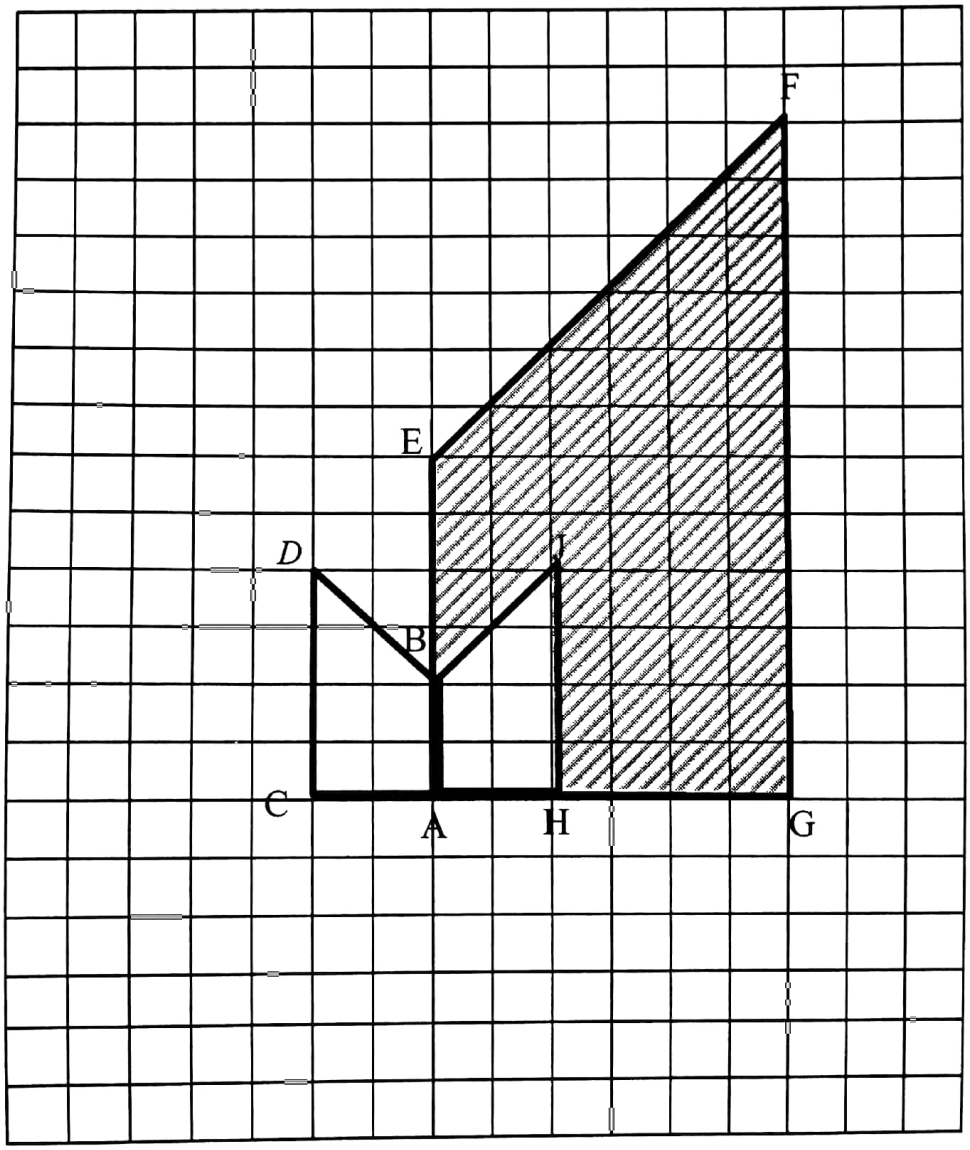
(ii) **RT**.

[4 marks]
[4 markah]

PAHANG

Scanned with CamScanner

(b) Diagram 13.2 shows three quadrilateral , *ABCD*, *AHJB* and *AEFG* drawn on square grids.
Rajah 13.2 menunjukkan tiga pentagon, ABCD, AHJB dan *AEFG dilukis pada grid segi empat sama .*



Rajah 13.2

(i) Trapezium AEFG is the image of trapezium ABCD under the combined transformations **VU**. Describe in full, the transformation:

Trapezium *AEFG* ialah imej bagi trapezium ABCD *di bawah gabungan penjelmaan* **VU**.
Huraikan selengkapnya penjelmaan :

(a) **U**

(b) **V**

PAHANG

[5 marks]
[5 markah]

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(a) Rajah 14.1 menunjukkan titik R yang dilukis pada suatu satah Cartesan.
Diagram 14.1 *shows point R drawn on a Cartesian plane.*

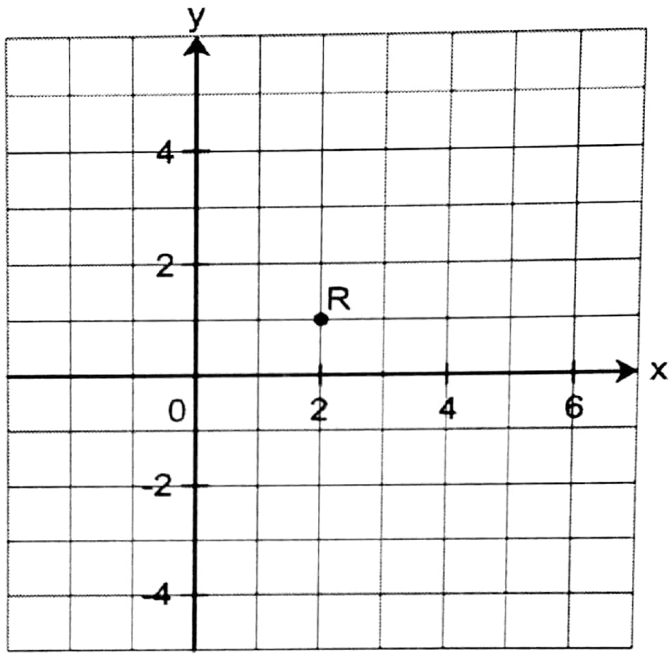

Diagram 14.1/ Rajah 14.1

Penjelmaan **T** ialah satu translasi $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$. Penjelmaan **P** ialah satu pantulan pada $y = 0$.

Transformation **T** *is a translation* $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$. *Transformation* **P** *is a reflection in the line* $\boldsymbol{y = 0}$.

Nyatakan koordinat imej bagi R di bawah penjelmaan berikut:
State the coordinates of the image of point R under the following Transformations.

(i) **T**
(ii) **TP**

JOHOR 4

[3 markah / *marks*]

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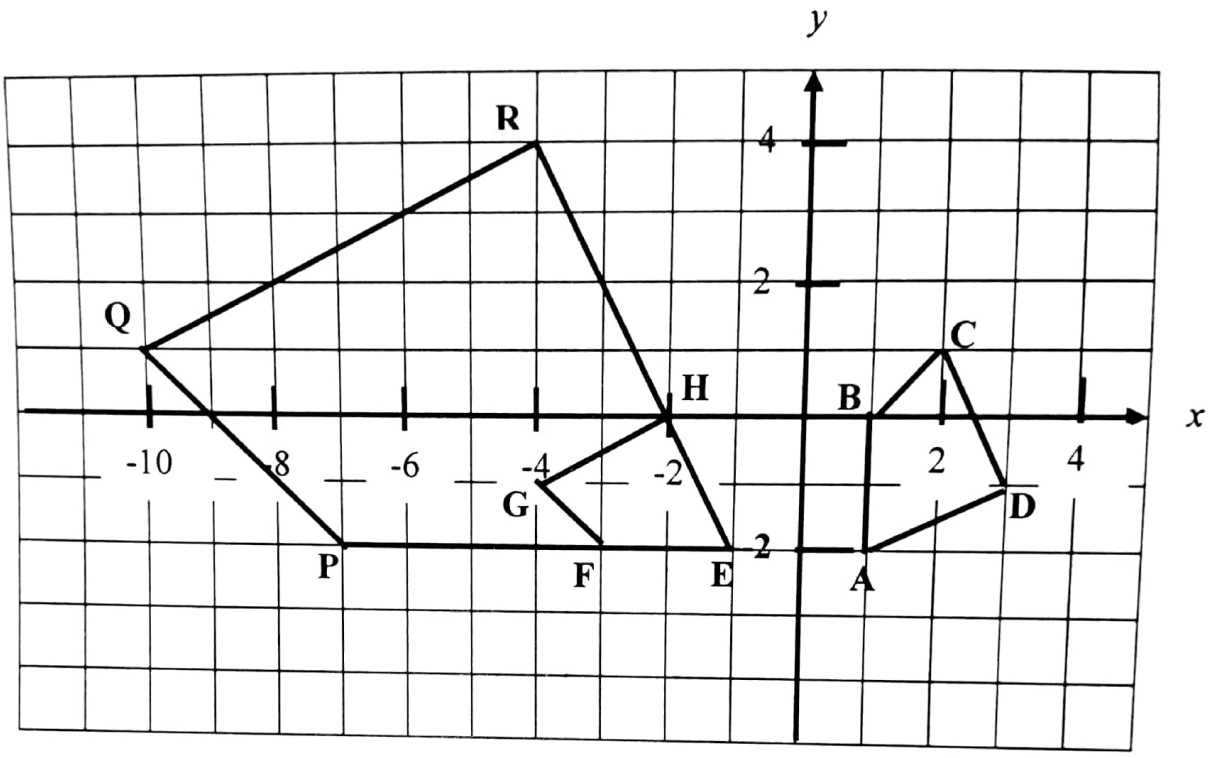
(b) Rajah menunjukkan segi empat, *ABCD*, *EFGH* and *EPQR* pada suatu satah Cartesian
Diagram shows quadrilaterals ABCD, EFGH and EPQR on a Cartesian plane.



JOHOR 4

Rajah / *Diagram* 14.2

(i) *EPQR* ialah imej bagi *ABCD* di bawah gabungan penjelmaan **NM**. Huraikan selengkapnya penjelmaan **M** dan penjelmaan **N**.

EPQR is the image of ABCD under the combined transformations **NM**. *Describe in full, the transformation* **M** *and the transformation* **N**:

[6 markah / *marks*]

(ii) Diberi bahawa EFGH mewakili kawasan yang mempunyai luas $35m^2$. Hitung luas, dalam m^2, kawasan yang mewakili oleh FPQRHG.

Given that EFGH represents a region of area $35m^2$. *Calculate the area, in* cm^2, *of the region represented by FPQRHG.*

[3 markah / *marks*]

Scanned with CamScanner

4. (a) The diagram shows the point P and the straight line $y + x = k$ drawn on a Cartesan plane

Rajah menunjukkan titik P dan garis lurus $y + x = k$ dilukis pada suatu satah Cartesan.

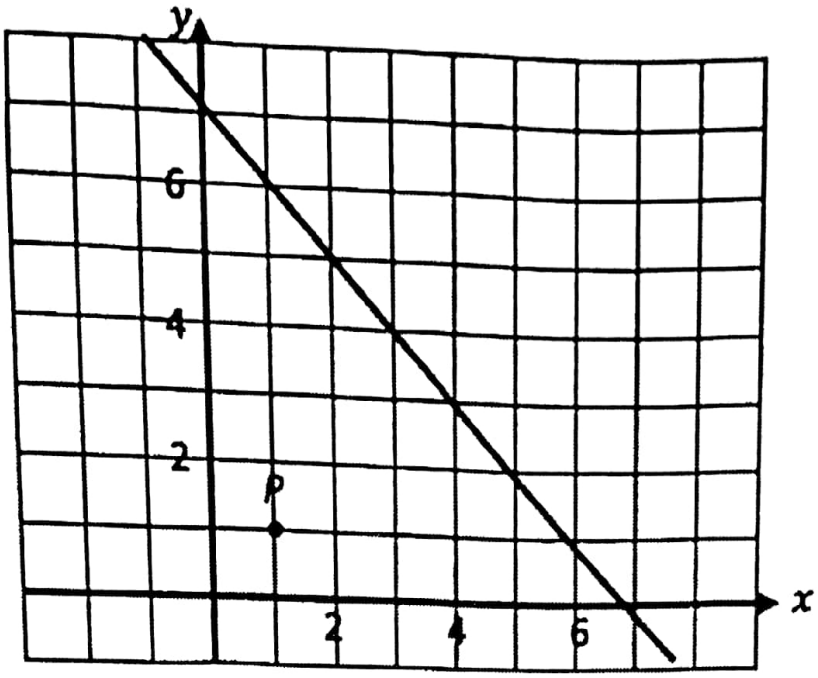


Diagram 8

Rajah 8

KELANTAN

Transformation T is a translation $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$.

Penjelmaan T ialah satu translasi $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$.

The transformation R is a reflection of the line $y + x = k$.

Penjelmaan R ialah satu pantulan pada garis $y + x = k$.

i) State the value of k

Nyatakan nilai bagi k

ii) State the image coordinates of point B under TR transformation.

Nyatakan koordinat imej bagi titik B di bawah penjelmaan TR.

[3 marks/ 3 markah]

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(b) Diagram 9 showing sides M and N, drawn on a Cartesan plane.

Rajah 9 menunjukkan sisiempat M dan N, dilukis pada suatu satah Cartesan.

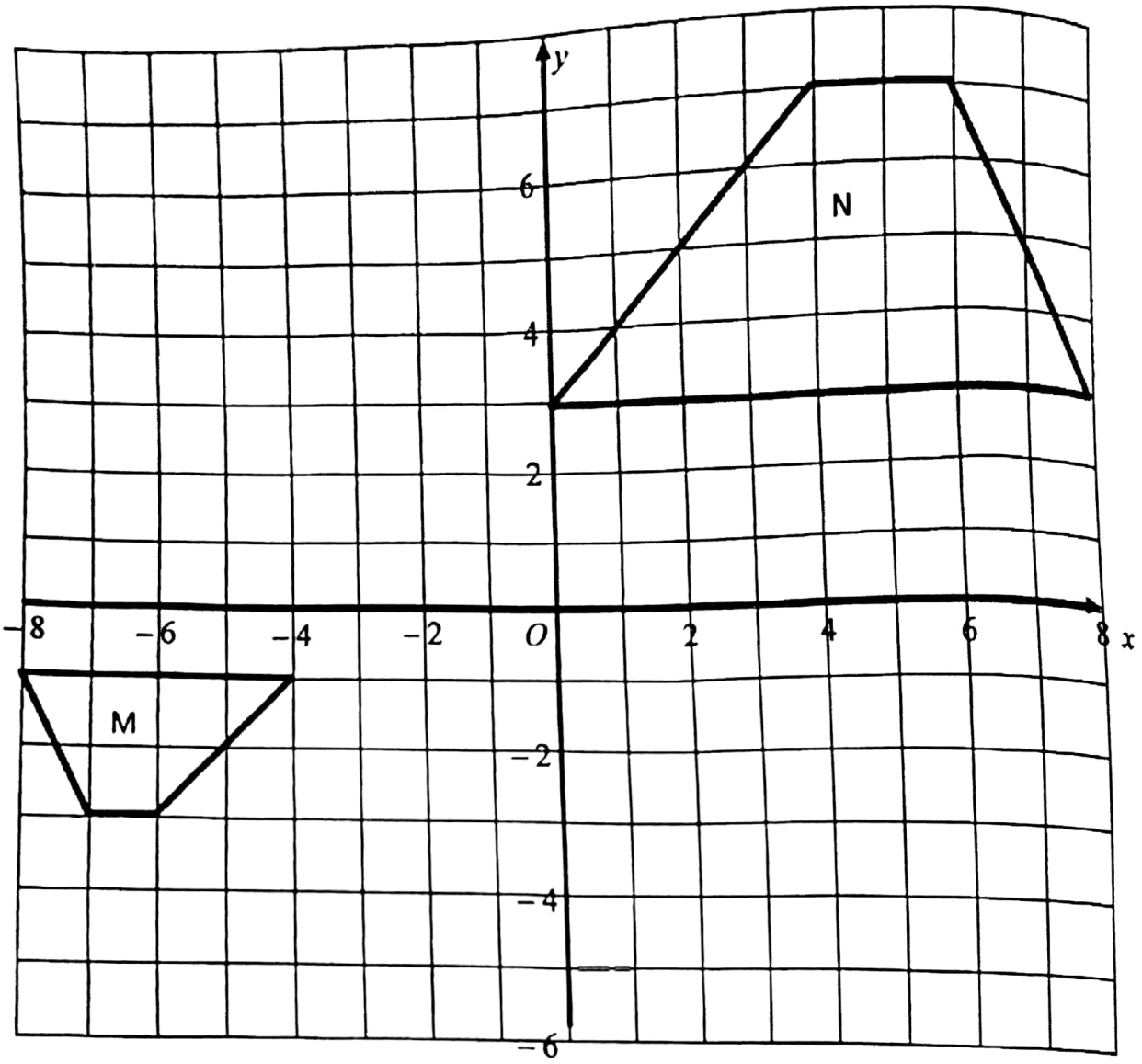

Diagram 9

Rajah 9

KELANTAN

i) The four sides of M are images of the four sides of N under the combination of UV illumination. Describe more about U and V. (6 marks)

Sisi empat M ialah imej bagi sisi empat N di bawah gabungan penjelmaan UV. Huraikan selengkapnya penjelmaan U dan penjelmaan V. *(6 markah)*

ii) Given that the four sides of N represent an area of 30 m^2, compute the area, in m^2, of the area represented by M

Diberi bahawa sisi empat N mewakili suatu kawasan yang mempunyai luas 30 m^2, hitung luas, dalam m^2, kawasan yang diwakili M [3 markah]

Scanned with CamScanner

(a) Diagram 9.1 shows point M and point N marked on a Cartesian plane.
Rajah 9.1 menunjukkan titik M dan titik N ditanda pada suatu satah Cartes.

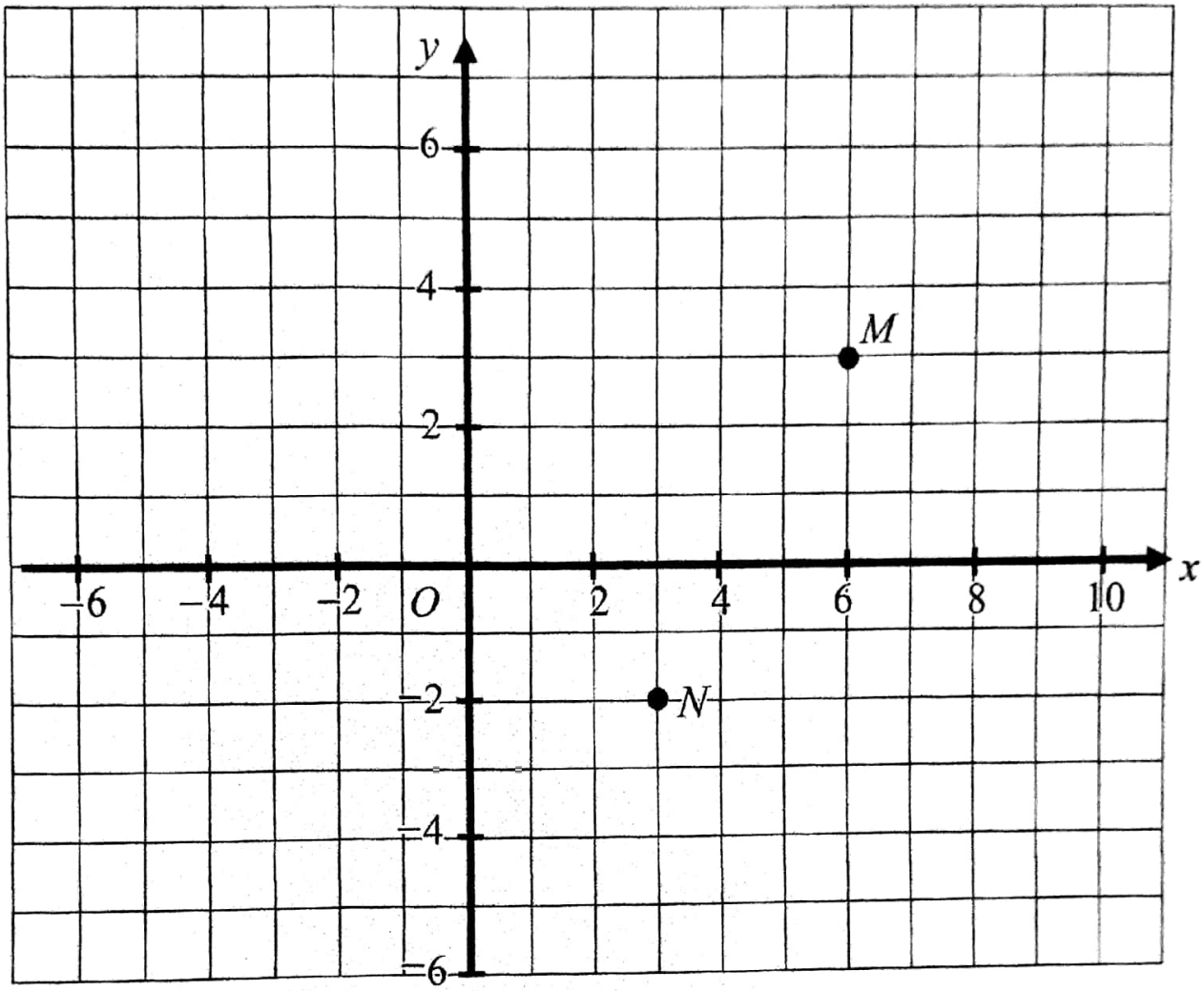

Diagram 9.1
Rajah 9.1

SELANGOR (SET 2)

Transformation **P** is a reflection at the line $x = 3$.
Transformation **T** is an anticlockwise rotation of 90° about centre N.
Transformation **R** is an enlargement about the centre $(-2, 4)$ with a scale factor 2.
State the coordinates of the image of point M under each of the following transformations:

Penjelmaan **P** *ialah pantulan pada garis* $x = 3$.
Penjelmaan **T** *ialah putaran* 90° *melawan arah jam pada pusat N.*
Penjelmaan **R** *ialah pembesaran pada pusat* $(-2, 4)$ *dengan faktor skala 2.*
Nyatakan koordinat imej bagi titik M di bawah setiap penjelmaan berikut:

(i) **P**,

(ii) **RT**.

[3 marks]
[3 markah]

Scanned with CamScanner

(*b*) Diagram 9.2 shows three polygons *ABCDEF*, *GHIJKL* and *GMNPQR*, drawn on a Cartesian plane.

Rajah 9.2 menunjukkan tiga poligon ABCDEF, GHIJKL dan GMNPQR, dilukis pada suatu satah Cartes.

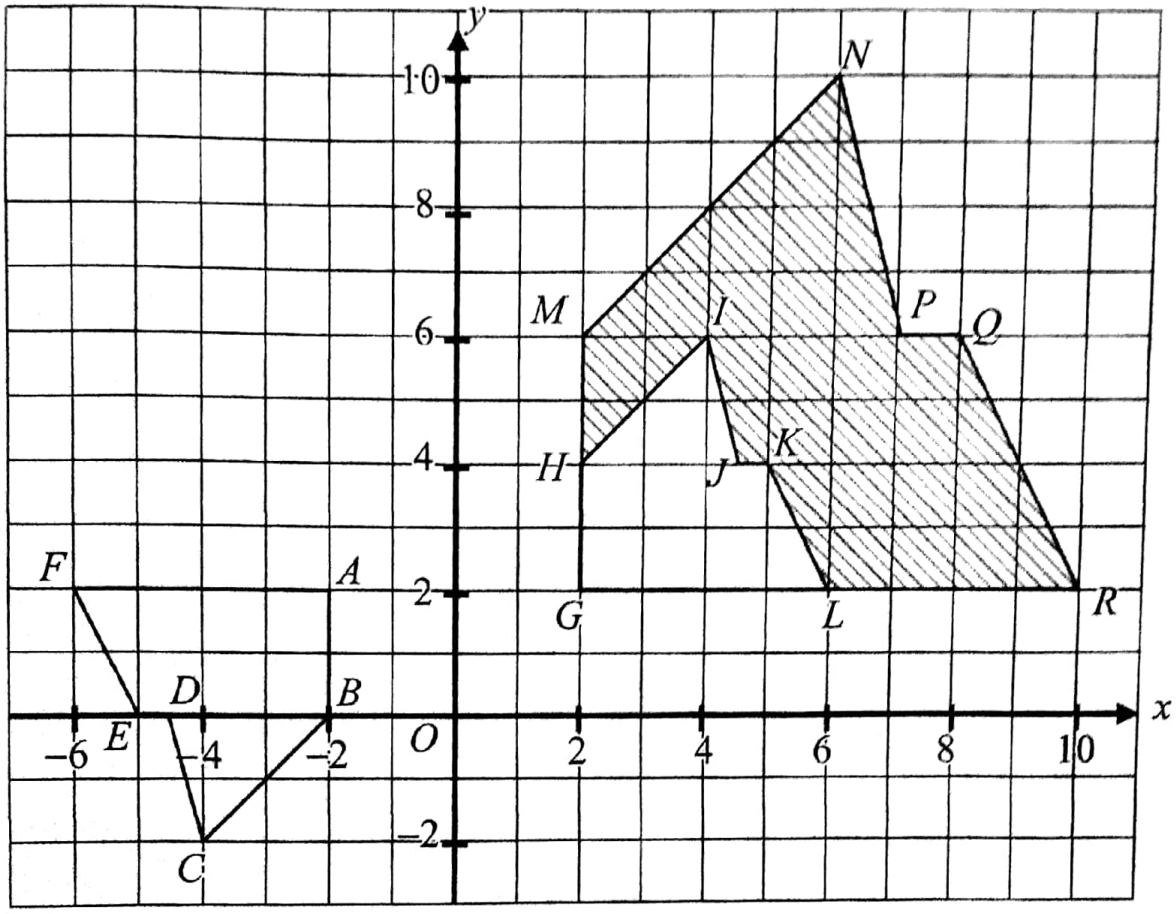

Diagram 9.2
Rajah 9.2

SELANGOR (SET 2)

(i) *GMNPQR* is the image of *ABCDEF* under the combined transformation **YZ**. Describe in full, the transformations:

GMNPQR ialah imej bagi ABCDEF di bawah gabungan penjelmaan **YZ**. *Huraikan selengkapnya penjelmaan:*

(*a*) **Z**,

(*b*) **Y**.

(ii) It is given that polygon *ABCDEF* represents a region with an area of 28 m^2. Calculate the area, in m^2, of the shaded region.

Diberi bahawa poligon ABCDEF mewakili suatu kawasan yang mempunyai luas 28 m^2. *Hitung luas, dalam* m^2, *kawasan berlorek.*

[9 *marks*]
[9 *markah*]

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(*a*) (i) (0, 3)

(ii) (−2, −2)

Note :

(−2, −2) is marked on the diagram *or* (−2, 1) is seen *or* (−2, 1) is marked on the diagram, award P1.

(*b*) (i) (*a*) **V** = Rotation of 180° about the centre (0, 2).

Putaran 180° *pada pusat* (0, 2).

Note :

1. Rotation 180° *or* Rotation, centre (0, 2) // *Putaran* 180° *or Putaran, pusat* (0, 2), award P2.
2. Rotation // *Putaran*, award P1

(*b*) **W** = Enlargement about the centre *G*(2, 2) with the scale factor 2.

Pembesaran pada pusat G(2, 2) *dengan faktor skala* 2.

Note :

1. Enlargement , centre *G*(2, 2) *or* Enlargement, scale factor 2 // *Pembesaran, pusat G*(2, 2) *or Pembesaran, faktor skala* 2, award P2.
2. Enlargement // *Pembesaran*, award P1.

(ii) $(*2^2 \times 28) - 28$

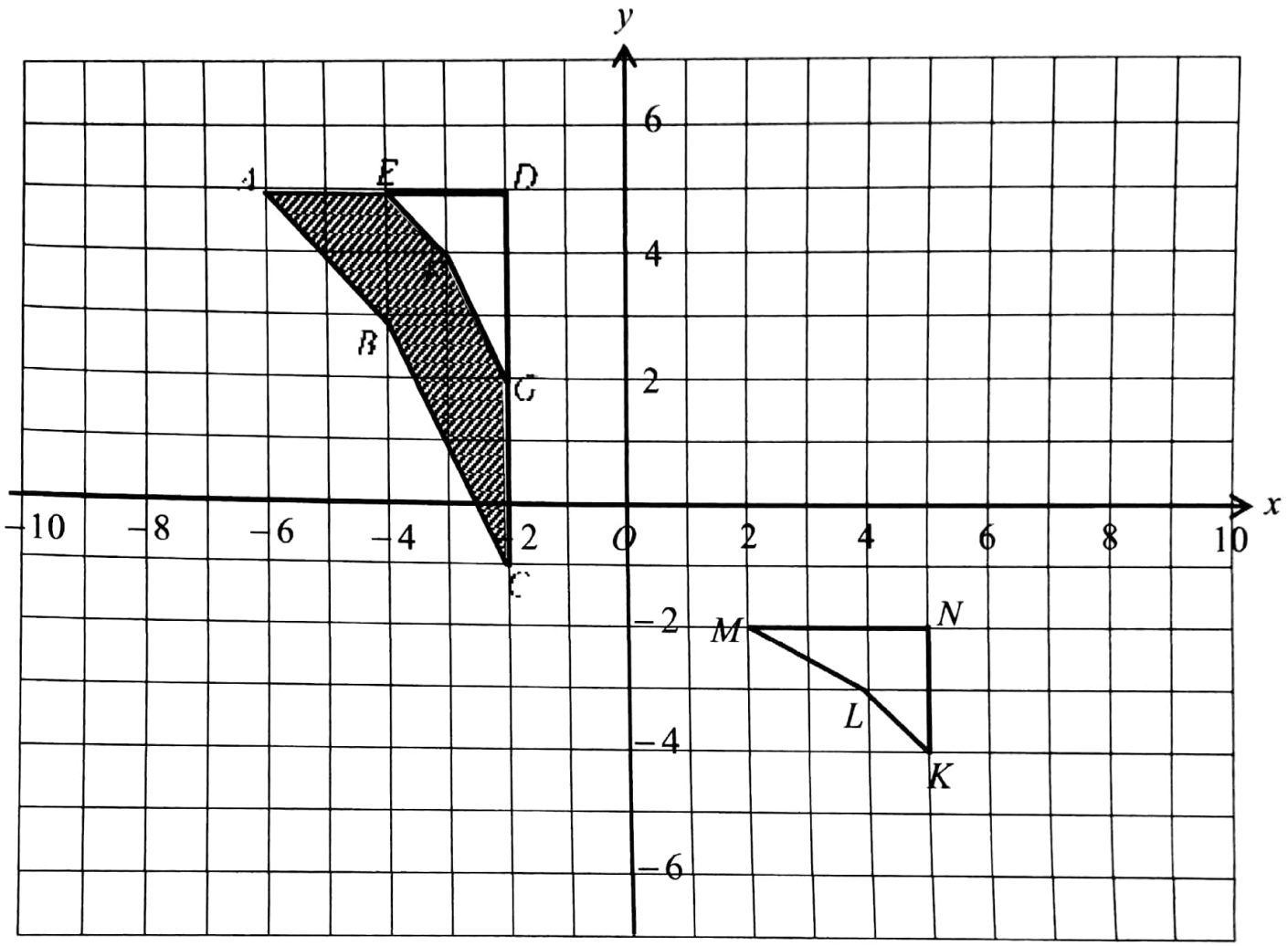
Note :

$(*2^2 \times 28)$ award K1

84

Scanned with CamScanner

Rajah 13 menunjukkan tiga sisi empat *ABCD*, *EFGD* dan *KLMN* dilukis pada suatu satah Cartes.



Rajah 13

KEDAH (AGAMA)

(*a*) Penjelmaan **T** ialah translasi $\begin{pmatrix} 5 \\ 2 \end{pmatrix}$.

Penjelmaan **P** ialah pantulan pada garis $x = -1$.

Penjelmaan **R** ialah putaran $90°$ lawan arah jam pada pusat (3 , 1).

Nyatakan koordinat imej bagi titik *C* di bawah setiap penjelmaan berikut:

(i) $\mathbf{T}^2$,

(ii) **PR**.

[4 markah]

Scanned with CamScanner

(*b*) (i) Sisi empat *KLMN* ialah imej bagi sisi empat *ABCD* di bawah **gabungan penjelmaan WV**.

Huraikan selengkapnya penjelmaan:

(a) V,

(b) W.

KEDAH (AGAMA)

(ii) Diberi bahawa heksagon *ABCGFE* mewakili suatu kawasan yang mempunyai luas 37.5 m^2.

Hitung luas, dalam m^2, sisi empat *KLMN*.

(8 markah)

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(a) Diagram 13.1 shows point K on a Cartesian plane.
Rajah 13.1 menunjukkan titik K pada suatu satah Cartes.

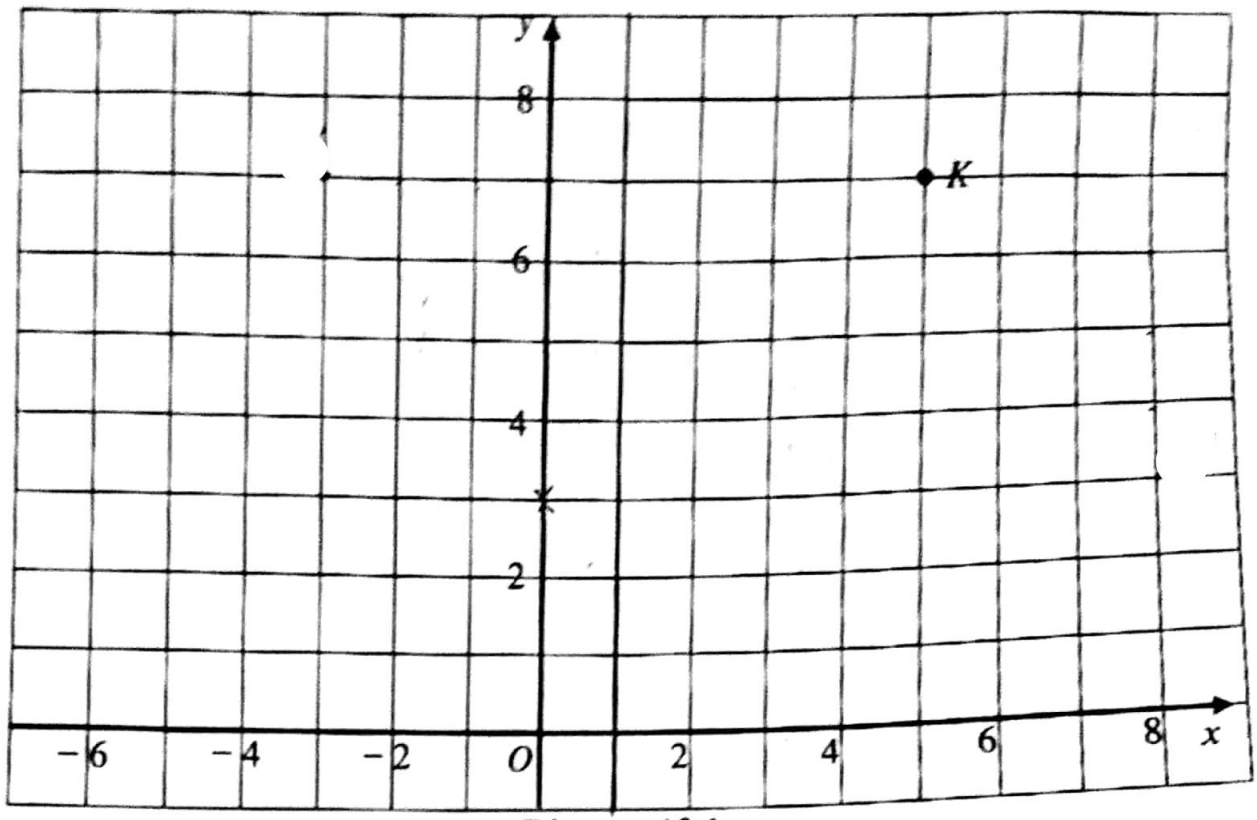

Diagram 13.1
Rajah 13.1

Transformation **E** is a translation $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$.

Transformation **F** is a reflection in the line $x = 1$.

Penjelmaan **E** *ialah translasi* $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$.

Penjelmaan **F** *ialah pantulan pada garis* $x = 1$.

State the coordinates of the image of point K under each of the following transformations:
Nyatakan koordinat imej bagi titik K di bawah penjelmaan berikut:

(i) **E,**

(ii) **EF**

[3 *marks*]
[3 *markah*]

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(b) Diagram 13.2 shows three pentagons *ABCDE*, *FGHKL* and *JMNPQ* drawn on a Cartesian plane.

Rajah 13.2 menunjukkan tiga pentagon ABCDE, FGHKL dan JMNPQ dilukis pada suatu satah Cartes.

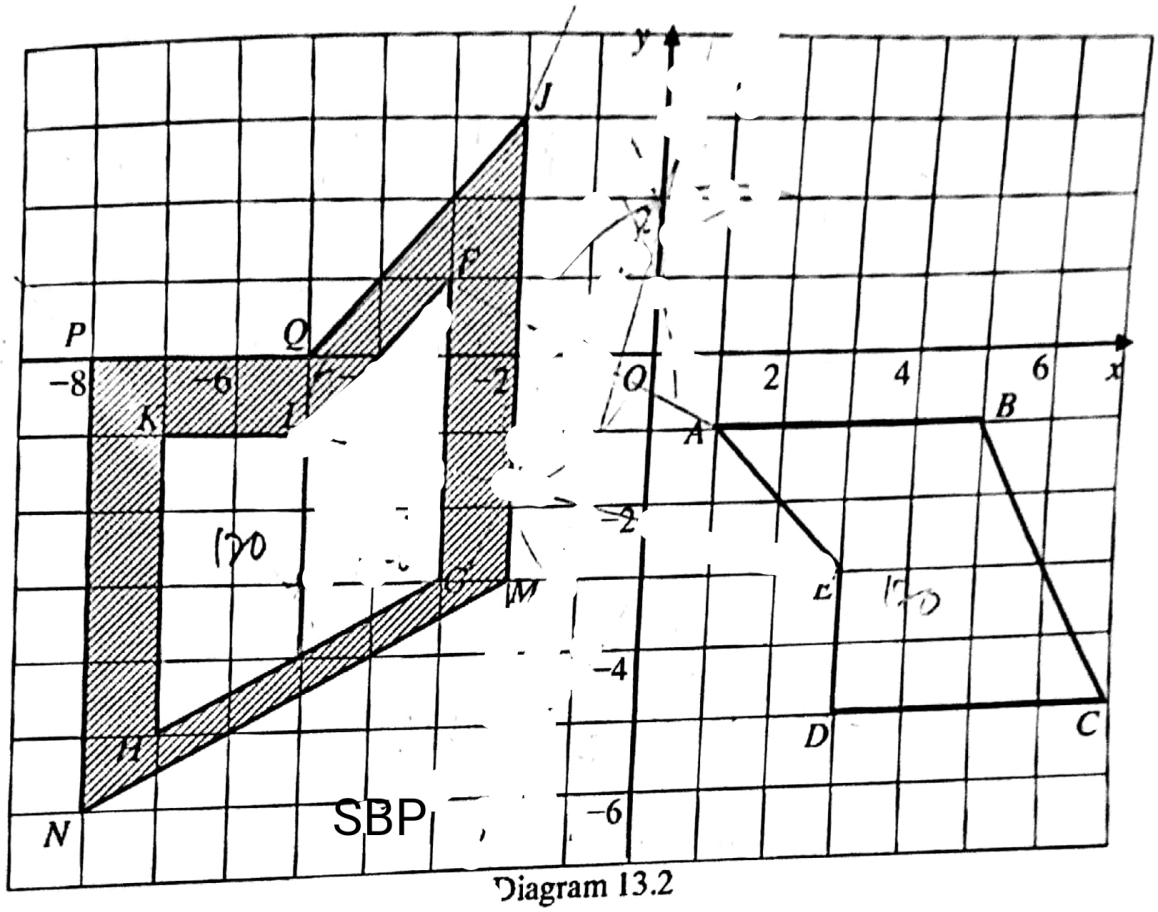

Diagram 13.2

Rajah 13.2

(i) *JMNPQ* is the image of *ABCDE* under the combined transformation **VU**. Describe in full, the transformation:

JMNPQ ialah imej bagi ABCDE di bawah gabungan penjelmaan **VU**. *Huraikan selengkapnya penjelmaan:*

(*a*) **U**,

(*b*) **V**.

[6 *marks*]
[6 *markah*]

(ii) It is given that the pentagon *ABCDE* represent the region of area 120 cm^2.
Calculate the area, in cm^2, of the shaded region.

Diberi bahawa pentagon ABCDE mewakili suatu kawasan yang mempunyai luas 120 cm^2.
Hitung luas, dalam cm^2, *kawasan yang berlorek.*

[3 *marks*]
[3 *markah*]

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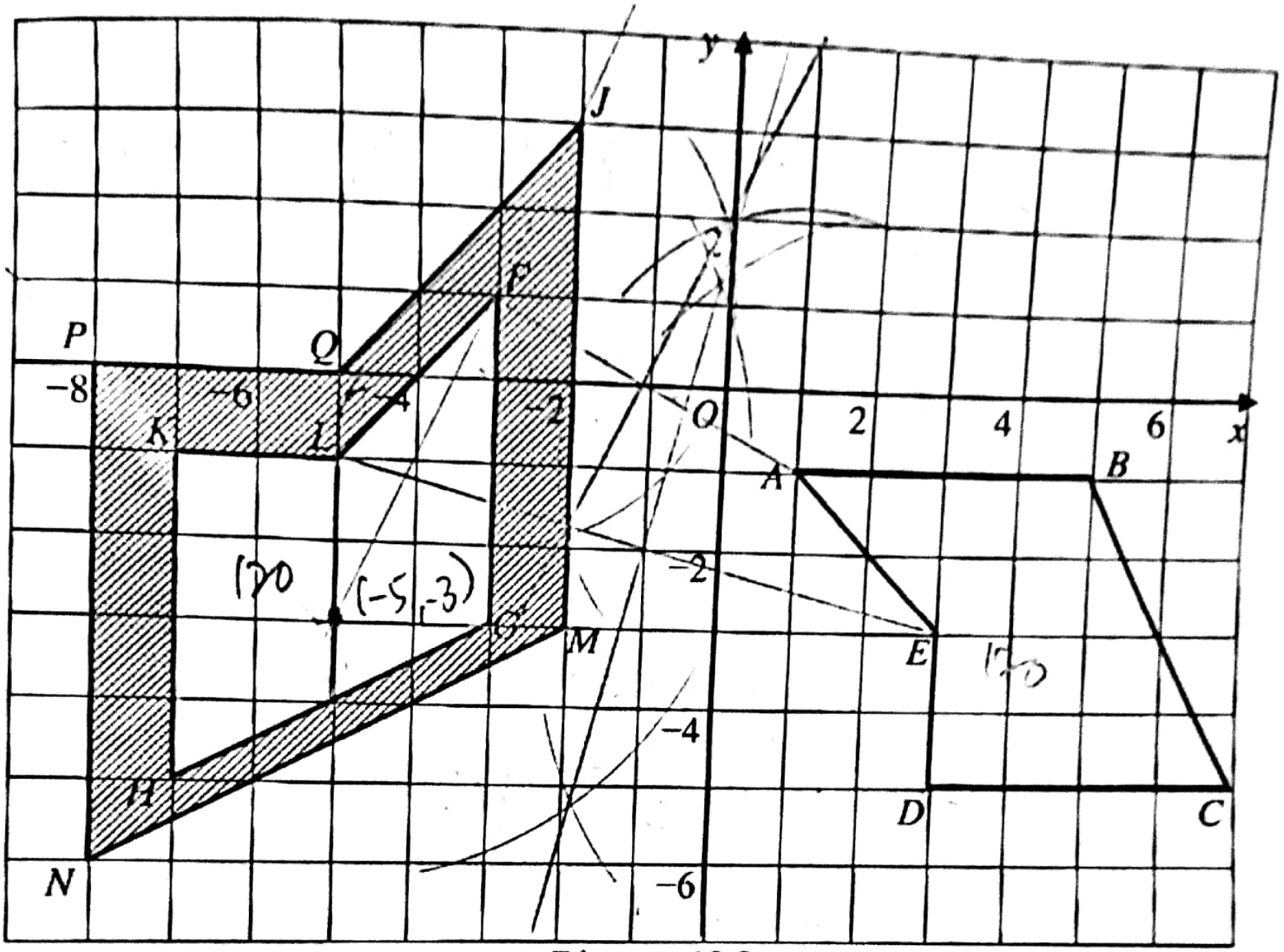

Diagram 13.2

Rajah 13.2

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(a) Diagram 9.1 shows point M and point N marked on a Cartesian plane.

Rajah 9.1 menunjukkan titik M dan titik N ditanda pada suatu satah Cartes.

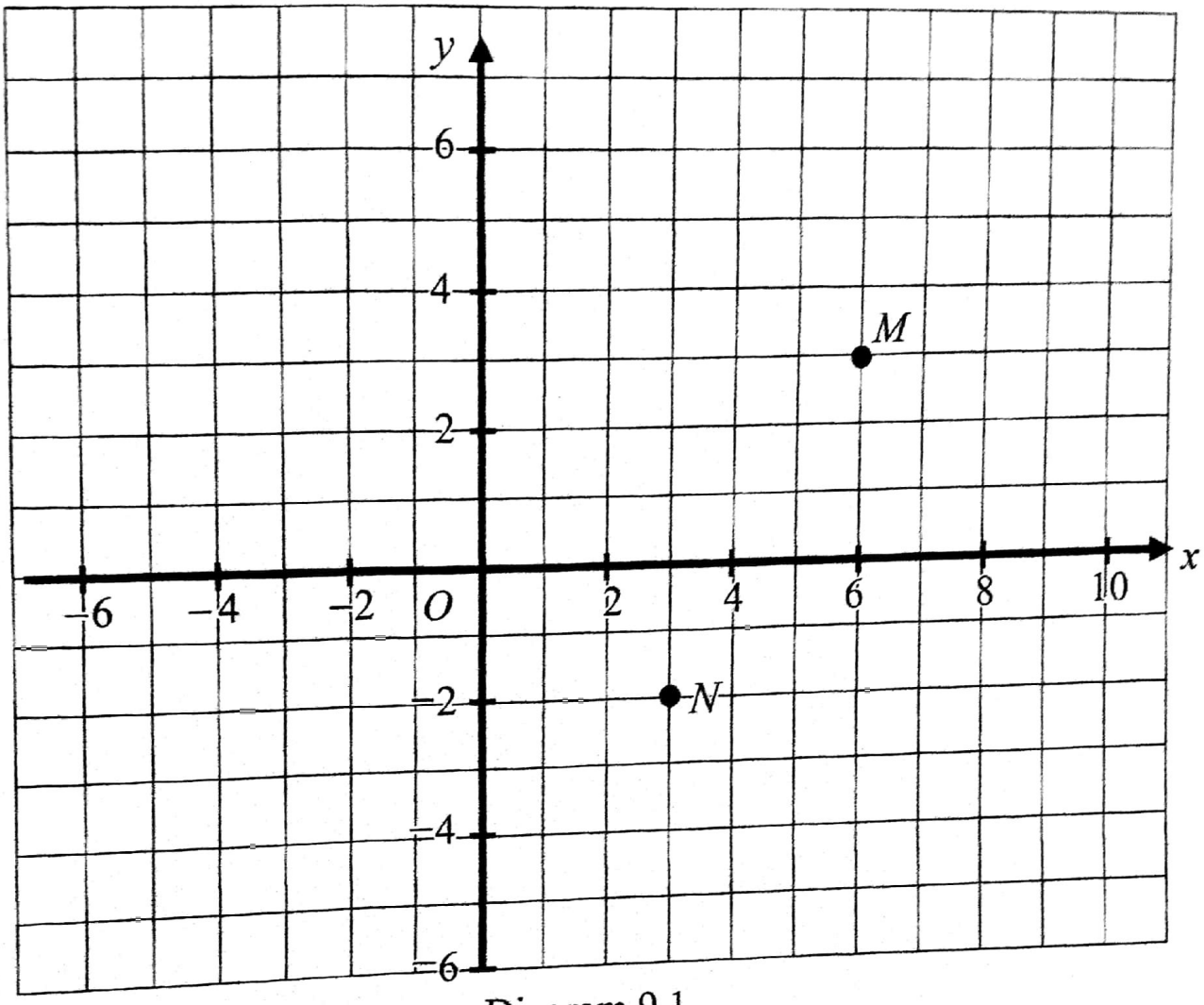

Diagram 9.1
Rajah 9.1

SELANGOR (SET 2)

Transformation **P** is a reflection at the line $x = 3$.
Transformation **T** is an anticlockwise rotation of 90° about centre N.
Transformation **R** is an enlargement about the centre $(-2, 4)$ with a scale factor 2.
State the coordinates of the image of point M under each of the following transformations:

Penjelmaan **P** *ialah pantulan pada garis* $x = 3$.
Penjelmaan **T** *ialah putaran* 90° *melawan arah jam pada pusat N.*
Penjelmaan **R** *ialah pembesaran pada pusat* $(-2, 4)$ *dengan faktor skala* 2.
Nyatakan koordinat imej bagi titik M di bawah setiap penjelmaan berikut:

(i) **P**,

(ii) **RT**.

[3 *marks*]
[3 *markah*]

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(*b*) Diagram 9.2 shows three polygons *ABCDEF*, *GHIJKL* and *GMNPQR*, drawn on a Cartesian plane.

Rajah 9.2 menunjukkan tiga poligon ABCDEF, GHIJKL dan GMNPQR, dilukis pada suatu satah Cartes.

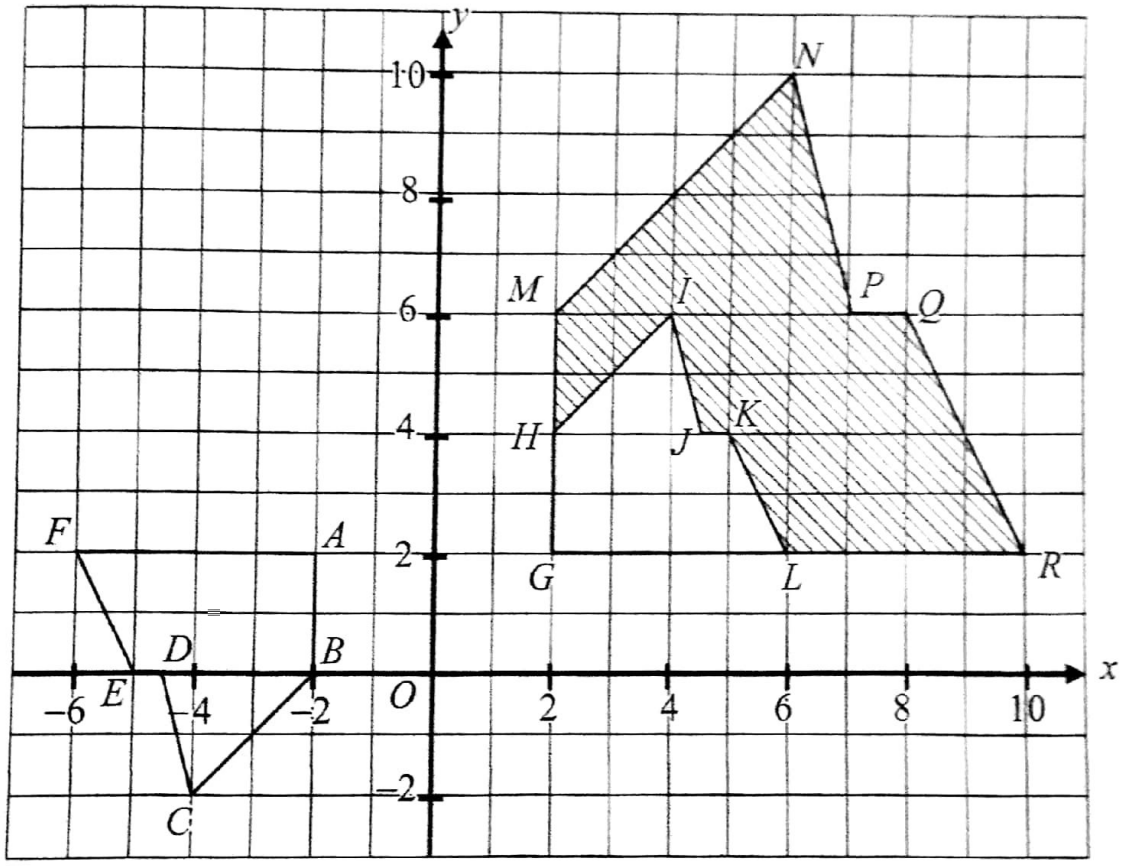

Diagram 9.2
Rajah 9.2

SELANGOR (SET 2)

(i) *GMNPQR* is the image of *ABCDEF* under the combined transformation **YZ**. Describe in full, the transformations:

GMNPQR ialah imej bagi ABCDEF di bawah gabungan penjelmaan **YZ**. *Huraikan selengkapnya penjelmaan*:

(*a*) **Z**,

(*b*) **Y**.

(ii) It is given that polygon *ABCDEF* represents a region with an area of 28 m^2. Calculate the area, in m^2, of the shaded region.

Diberi bahawa poligon ABCDEF mewakili suatu kawasan yang mempunyai luas 28 m^2. *Hitung luas, dalam* m^2, *kawasan berlorek.*

[9 *marks*]
[9 *markah*]

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(*a*) (i) (0, 3)

(ii) (−2, −2)

Note :

(−2, −2) is marked on the diagram *or* (−2, 1) is seen *or* (−2, 1) is marked on the diagram, award P1.

(*b*) (i) (*a*) **V** = Rotation of 180° about the centre (0, 2).

Putaran 180° *pada pusat* (0, 2).

Note :

1. Rotation 180° *or* Rotation, centre (0, 2) // *Putaran* 180° *or Putaran, pusat* (0, 2), award P2.
2. Rotation // *Putaran*, award P1

(*b*) **W** = Enlargement about the centre *G*(2, 2) with the scale factor 2.

Pembesaran pada pusat G(2, 2) *dengan faktor skala* 2.

Note :

1. Enlargement , centre *G*(2, 2) *or* Enlargement, scale factor 2 // *Pembesaran, pusat G*(2, 2) *or Pembesaran, faktor skala* 2, award P2.
2. Enlargement // *Pembesaran*, award P1.

(ii) $(*2^2 \times 28) - 28$

Note :

$(*2^2 \times 28)$ award K1

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